PB-229 723

CONFERENCE IN THE MATTER OF POLLUTION OF THE INTERSTATE WATERS OF THE MENOMINEE RIVER AND ITS TRIBUTARIES. VOLUME II. HELD AT MENOMINEE, MICHIGAN ON NOVEMBER 7-8, 1963

Public Health Service
Washington, D. C.

8 November 1963

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CONFERENCE

in the matter of

Pollution of the Interstate Waters of the

MENOMINEE RIVER AND ITS TRIBUTARIES

VOLUME II

Menominee, Michigan
November 7-8, 1963

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Washington, D.C.

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CONFERENCE

in the matter of

Pollution of the Interstate Waters of the

MENOMINEE RIVER AND ITS TRIBUTARIES

VOLUME II

Menominee, Michigan
November 7-8, 1963

U.S. Department of Health, Education, and Welfare

Washington, D.C.

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[illegible] [illegible] on Sanitary sewers, chemical company [illegible], pollution, discharge [illegible] [illegible]

Conference in the Matter of Pollution of Interstate Waters of the Menominee River and its tributaries (Michigan-Wisconsin) convened at 9:05 a.m., C.S.T., on Thursday, November 7, 1963, in Goodfellowship Hall, Menominee, Michigan.

PRESIDING:

Mr. Murray Stein, Chief, Enforcement Branch, Water Supply and Pollution Control, Public Health Service, Department of Health, Education, and Welfare, Washington 25, D. C.

PRESENT:

(As noted in the transcript of November 6, 1963.)

PROCEEDINGS

MR. STEIN: The conference in the matter of pollution of the interstate waters of the Menominee River is open again for the second day, and Wisconsin will continue with its statement. Mr. Muegge.

MR. MUEGGE: I would like to call Carl Blabaum, Assistant Director of the Water Pollution Control Division of the State Board of Health. Incidentally, Mr. Blabaum will discuss the industrial waste angles insofar as the Wisconsin part of the Menominee River Basin is concerned.

STATEMENT OF CARL J. BLABAUM, ASSISTANT DIRECTOR, WISCONSIN STATE BOARD OF HEALTH, WATER POLLUTION CONTROL DIVISION

MR. BLABAUM: As Mr. McDermott indicated to you yesterday, Wisconsin industries discharging wastes to surface waters are under surveillance of the Committee on Water Pollution. That body is empowered by statutes to exercise general supervision over the administration and enforcement of all laws relating to pollution of surface waters of the State and has the power to make and enforce rules and regulations, hold hearings, issue orders and execute whatever is reasonable and proper to control pollution of the surface waters of the State.

There are four sources of industrial wastes in Wisconsin which have the potential for direct pollution of surface water in the Menominee-Brule River Basin. All of these industries maintain waste treatment or disposal facilities. Descriptions of the industries and the controls they exercise over waste discharges will be outlined.

Wausaukee River

Wausaukee Cheese Factory (Pauly Cheese Company, A Division of Swift and Company)

C. J. BLABAUM

The Wausaukee Cheese Factory located at Wausaukee on the Wausaukee River processes milk to produce American and Italian cheese. Flush whole milk intake at that factory in 1961 was estimated as 23,000 pounds per day.

This company utilizes a program of hauling whey and can washings for land disposal. Floor drains within the factory continue to discharge to the stream but with the high dilution of the small volume of wastes involved no appreciable effect on the biochemical oxygen demand or the dissolved oxygen could be detected by surveys made by our department.

Sanitary sewage originating at the cheese factory is discharged to a separate septic tank and dry well system.

It appears that the cheese company has continued to effectively use the techniques of disposal described here; therefore, the Wausaukee factory is not considered a significant source of pollution.

Menominee River

Kimberly-Clark Corporation

At Niagara, groundwood and sulfite pulp produced in Kimberly-Clark's integrated mill is blended with purchased pulp to manufacture book paper. Saveall systems are used in the paper mill to reduce fiber loss. In the pulp mill whitewater is recirculated for washing blow pits and this practice of filtering the whitewater through pulp tends to reduce the concentration of suspended solids discharged to the river.

In 1953 the company experimentally offered spent sulfite pulping liquor as roadbinder. That summer 114,000 gallons were withheld from the river for this purpose. During 1954, roadbinder use totaled only 40,000 gallons. Following the issuance of Order 2-54J-13 in 1954, Kimberly-Clark Corporation at Niagara instituted a plan for hauling spent sulfite liquor for land disposal at a spray irrigation site to augment the roadbinder program. Roadbinder and spray irrigation disposal accounted for about 2,550,000 gallons of spent liquor in 1955. According to reports in committee files, hauling resulted in disposal of the following quantities of spent liquor since then:

1956	3,595,000 gallons
1957	14,342,000
1958	711,000
1959	480,000
1960	756,000
1961	620,000
1962	1,300,000

The Niagara mill of Kimberly-Clark Corporation is acknowledged to be the largest source of pollutional material discharged to the Menominee River. In spite of the high reaeration capacity of the river below Niagara, slime growths are evident for some distance below the mill and the prevalence of tolerant bottom organisms results in categorizing that section of stream as polluted from the biological standpoint.

Scott Paper Company

Scott Paper Company operates an integrated sulfite pulp and paper mill at Marinette. In the paper mill, operation of savealls and some reuse of whitewater decreases fiber loss. Paper machine shower water is reclaimed and returned to the showers. Pulp mill whitewater is returned from the wet room to the blow pits where it is used for stock washing and as process water. Screenings are lapped on a wet machine.

A portion of the spent sulfite liquor from this mill has been used for dust control and roadbinder since before 1947. More recently, some spent liquor has been used to "pad" the digester blows to enhance collection of higher concentrations of spent liquor solids.

Departmental records indicate spent liquor hauled for roadbinder was as follows during years for which data are available:

1954	662,000 gallons
1955	940,000
1956	552,000
1957	525,000
1958	699,300
1959	224,500
1960	267,500
1961	310,800
1962	273,000
1963	192,000 (through September)

Scott Paper Company in Marinette is only three miles from Green Bay and there is insufficient flow time for the biochemical oxygen demand to markedly reduce dissolved oxygen. Presence of bacterial slimes, fiber, wood chips and tolerant bottom organisms has been noted below the mill.

Ansul Chemical Company

Ansul Chemical Company, Marinette, manufacturers of dry chemical fire extinguishers and fire fighting chemicals, was considered a source of acid waste pollution during the 1953 studies of the Menominee River. In 1955, a plant was completed for recovery of a large percentage of the sulfuric acid which formerly had been wasted. The Ansul Chemical Company was not considered a source of pollution at the public hearing conducted by the Committee on Water Pollution and State Board of Health on March 29, 1962.

Production of methyl chloride has been discontinued by the firm since the 1962 hearing. Because of this processing change waste sulfuric acid is no longer produced by the Ansul Chemical Company and no pollutional wastes reach the river from that source.

MR. STEIN: Thank you.

Are there any comments or questions?

MR. PIERCE: No comments.

MR. STEIN: May I ask you just for clarification here?

MR. BLABAUM: Yes.

MR. STEIN: This is just a clarification question. I have looked at the figures on the roadbinder operations. For the Scott Paper Company, I think you might say there may be a trend downward, but for the Kimberly-Clark Company it kind of varies.

MR. BLABAUM: Yes.

MR. STEIN: Is that a steady market, or does that depend on when you have road-building in the area? I am just asking.

MR. BLABAUM: Yes. May we hold this question for a representative of the company, who will be able to present the company's viewpoint?

MR. STEIN: All right.

MR. BLABAUM: Very good.

Mr. Wisniewski has asked me to go on with the next portion of our report, entitled "Stream Conditions."

Routine cooperative river surveys are conducted annually in cooperation with the pulp and paper mills in Wisconsin.

On the Menominee River at Niagara, Wisconsin, the Kimberly-Clark Corporation collects samples from three stations.

At Station 1 above the dam at Niagara, during the period June 6 through August 29, 1963, the dissolved oxygen concentration ranged from 5.8 to 8.1 mg/1 at temperatures ranging from 16 to 25 degrees Centigrade.

At Station 2, one mile below Station 1, the dissolved oxygen ranged from 3.7 to 8.3 mg/1 at temperatures ranging from 16 to 24 degrees Centigrade.

At Station 3, five miles below Station 1, the dissolved oxygen ranged from 4.8 to 8.8 mg/1 at temperatures ranging from 16 to 24 degrees Centigrade.

C. J. Blabaum

During the period August 1 through 15, 1963, the daily average flow amounted to approximately 1,200 c.f.s. as compared to August average mean flows of 1,736 c.f.s. in 1960; 1,468 c.f.s. in 1961; and 1,392 c.f.s. in 1962.

Samples in the Marinette area were collected by the Scott Paper Company.

At Marinette upper dam, 3.3 miles above the mouth of the river, the dissolved oxygen ranged from 6.1 to 7.4 mg/1 during the period June 6 to August 29, 1963, while temperatures ranged from 16 to 27 degrees Centigrade.

At the lower dam, 2.3 miles above the mouth of the river, dissolved oxygen ranged from 4.8 to 6.1 mg/1 at temperatures ranging from 16 to 27 degrees Centigrade.

At Highway 41 Bridge, 1.7 miles above the mouth of the river, dissolved oxygen ranged from 4.0 to 7.3 mg/1 at temperatures ranging from 17.5 to 27 degrees Centigrade.

MR. MUEGGE: Are there any questions?

MR. STEIN: No.

MR. MUEGGE: Thank you, Mr. Blabaum.

I will now call on Lloyd Lueschow, our biologist.

STATEMENT OF LLOYD A. LUESCHOW, PUBLIC HEALTH BIOLOGIST, WISCONSIN COMMITTEE ON WATER POLLUTION

MR. LUESCHOW: As part of a State-wide survey, plankton conditions were investigated in the Menominee River on August 7, 1963.

General Techniques and Procedures

The field collections of plankton samples were made with a Clark-Bumpus sampler, towed behind a motorboat such that it was submerged approximately one foot below the surface. The Clark-Bumpus sampler incorporates a metering device that is calibrated such that a single revolution allows the passage of 4 liters of water. The plankton sample is collected in an attached plankton net, and after the tow is completed the plankton is removed from the net and transferred to a 10 percent formalin solution for preservation and laboratory analysis.

All chemical analyses were completed by personnel of the Wisconsin Laboratory of Hygiene in accordance with the Standard Methods for the Examination of Water and Wastewater, 11th Edition, 1960. Samples were analyzed for total solids, fixed and volatile solids, and a water sample was analyzed for lignin-like material.

MR. STEIN: Pardon me. A lot of the people in the audience do not have a copy of your report, so if you would please read a little more slowly, I am sure they will be able to hear you, and it would be appreciated.

MR. LUESCHOW: Yes.

MR. STEIN: Thank you.

MR. LUESCHOW: Plankton samples were examined microscopically to determine the various constituents and the relative amount of each constituent. Nearly all plankton could be quickly and easily identified to one of five general groups: Fibers and fiber knots, Sphaerotilus or other associated slime growth, algae, natural organic debris, and invertebrates. Percentage evaluations are merely estimates. However, most samples were clearly dominated by a combination of natural organic debris, algae and invertebrates, or by fiber and fiber knots.

Results of Investigation and Conclusions

Analyses of plankton samples collected during the survey are shown in Table E-1, which is attached to this report. The Highway 141 crossing above Niagara was sampled as a station (M1) unaffected by paper mill waste production.

It will be noted that the combination of algae, natural organic debris, and invertebrates clearly dominated the material in the net.

Sample M2, collected below the Kimberly-Clark Niagara mill, was taken in the river where a heavy waste load was obvious. The water was discolored and occasionally clumps of floating fibers could be observed. The volatile solids had increased to 724 mg/l and the material was clearly dominated by fiber and fiber knots. Sample M3 was collected on the opposite side of the river from M2, from a portion of the river that was not as clearly affected by the waste discharge of Kimberly-Clark. The volatile solids were substantially less than on the south bank but still apparently dominated by fiber and fiber knots.

Sample M4 was collected from the center of the river and 100 yards above Sand Portage Falls. A complete mixing was unlikely in the distance involved, but the volatile solids were 427 milligrams per liter higher than Station 3 (north bank) and lower than Station 2 (south bank). The volatile solids were clearly dominated by fiber and fiber knots.

Stations 2, 3 and 4 reveal significant increases in non-volatile solids as well as volatile solids. This is most likely due to filter materials used in the papermaking process since this section of river was not turbulent with suspended bottom materials.

Table E-1 reveals that the lignin concentration effected a sharp rise below the Kimberly-Clark mill as would be expected, but quickly fell off to more normal levels. Even Station 4 above Sand Portage Falls revealed a lignin concentration that was already stabilized when compared to a station much farther downstream.

Samples 5 to 10, collected at the indicated stations indicated on the map in the report, revealed a generally decreasing volatile solid concentration. Sample 8, below Pemene Falls, is an exception in that the volatile solid concentration revealed an increase. This is perhaps due to the fact that a launching site was not available and the Clark-Bumpus was held in the water near shore. The composition of the sample further indicates that additional volatile substances are natural organic debris and invertebrates.

Sample M6 was the only sample that revealed a substantial quantitv of slime. Sphaerotilus natans was prominent in the sample, but did not clearly dominate the planktonic material.

Samples M10 through M14 were collected in the Menominee River, Marinette area. Sample M10 was collected in the tailrace of the upper dam and analysis for solids indicated the same general quantity as above Niagara. Two samples were collected 300 yards below Scott Paper, one from each side of the river. The sample collected from the south shore revealed a substantial volatile solid increase as well as a lignin increase.

Sample M13 was collected 200 feet below the Highway 41 crossing from the channel area. The solids indicated a substantially higher than normal concentration, and microscopic examination indicated the material to be primarily fibers and slimes.

Sample M14 was collected approximately 300 yards below the outfall of Marathon Corporation on the north side of the channel. Volatile solids were substantially increased and slimes were noted.

Samples 15 to 18 were collected in Green Bay. Sample 15, collected between the breakwater and first channel marker, still revealed a substantial quantity of fibers. Fibers and slimes could be noted to one mile out in the bay, although the plankton was clearly dominated by algae.

This investigation has indicated substantial increases in fibers and fiber knots in plankton samples below the paper mills on the Menominee River. Total and volatile solids can be increased several hundred times over unpolluted waters, as in the case of the Kimberly-Clark mill at Niagara. Furthermore, these additional loads are apparent for distances downstream where they can exert an influence on the recreational potential of a natural watercourse.

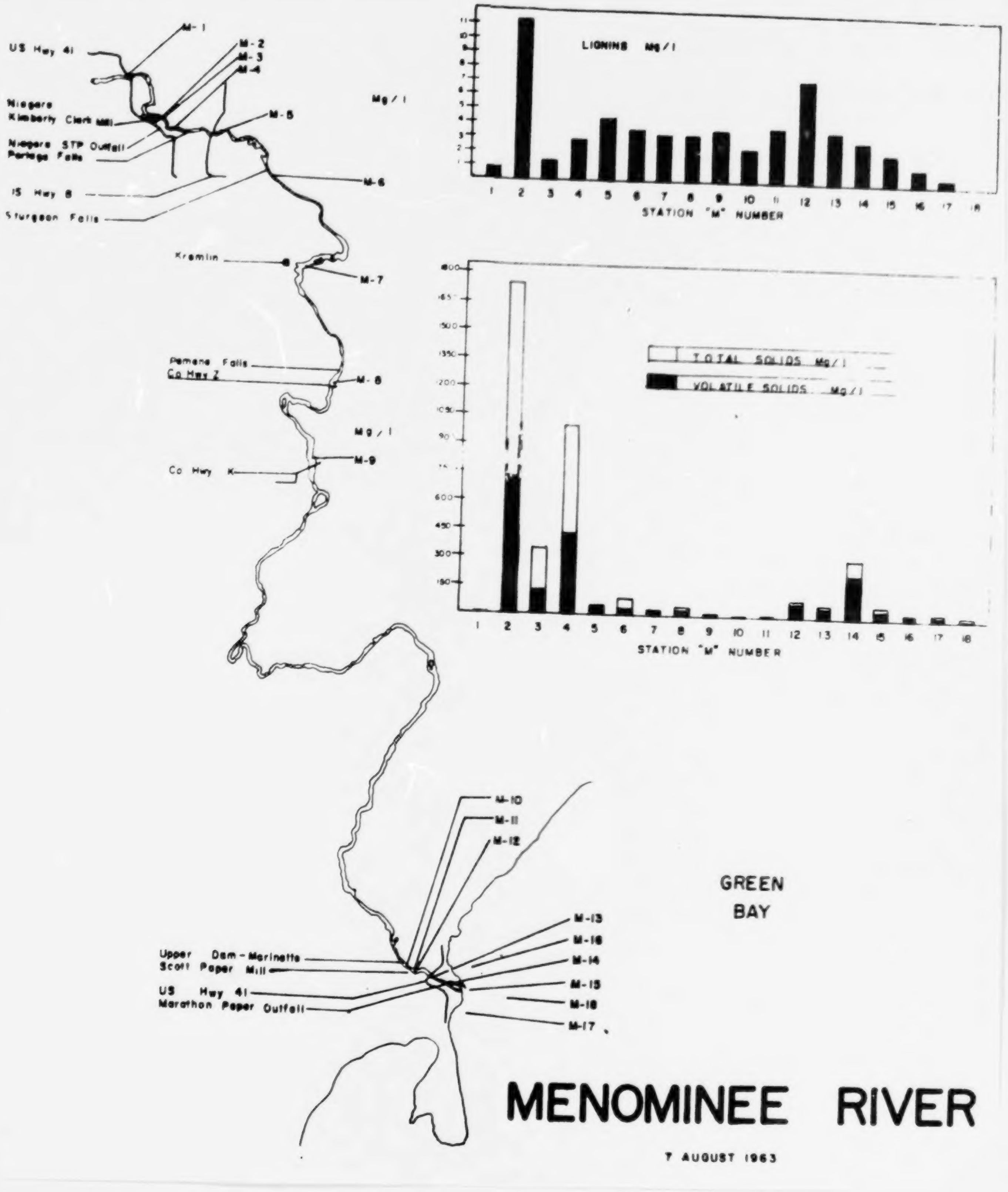
(Figure E-1 and map entitled "Menominee River are as follows:)

Table E-1
Menominee River
August 7, 1963

Sta. No.	Station Location	mg/l Lignin	Total Solids mg/l	Vol. Solids mg/l	% Fibers & Fiber Knots	% Slime Growth	% Algae	% Nat. Org. Debris	% Invertebrates
M1	Hwy. 141 Crossing, 3-mi. above Niagara	.8	2.53	1.70	-	-	5	5	90
M2	200 yds. below Niagara Mill - South Bank	11.2	1740.36	724.79	100	T	-	-	-
M3	200 yds. below Niagara Mill - North Bank	1.4	348.35	123.95	70	-	10	10	10
M4	100 yds. above Portage Falls - Center	2.8	994.22	427.25	95	T	-	5	-
M5	Highway 8 Crossing	4.3	64.19	56.23	90	T	-	10	-
M6	One-half mi. below Sturgeon Falls	3.6	81.12	55.19	5	20	2	65	8
M7	Section 23, east of Kremlin	3.2	28.61	14.22	-	-	5	70	25
M8	Section 17, 500 yds. below Pemene Falls, just above Co. Hwy. 2	3.2	38.70	30.07	-	-	5	65	30
M9	Co. Hwy. "K" Crossing just below Chalk Hill Dam	3.6	12.77	6.17	-	-	70	25	5
M10	Tailrace of Upper Dam, Marinette	2.3	3.75	1.74	-	-	40	20	40
M11	300 yds. below Upper Mill - North Shore	3.8	7.59	4.75	85	-	5	10	-
M12	300 yds. below Upper Mill - South Shore	7.2	93.31	87.10	90	-	T	10	-
M13	200 ft. below Hwy. 141 Br., Marinette - Center	3.6	62.27	50.98	90	5	-	5	-
M14	300 yds. below Marathon Outfall - North Side	3.0	301.27	219.39	90	T	-	10	-
M15	From Lighthouse to First Channel Marker	2.2	48.79	32.45	60	T	20	20	-

Table E-1 (Cont.)

Sta. No.	Station Location	mg/l Lignin	Total Solids mg/l	Vol. Solids mg/l	% Fibers & Fiber Knots	% Slime Growth	% Algae	% Nat. Org. Debris	% Invertebrates
M16	Green Bay, 1 mi. out & 1 mi. N. of Lighthouse	1.2	25.69	13.19	T	T	90	10	-
M17	Green Bay, 1 mi. out & 1 mi. S. of Lighthouse	.04	28.14	17.93	-	-	90	5	5
M18	Approximately 4-mi. out from Lighthouse	N.S.	11.49	6.62	-	-	90	5	5


M-1
US Hwy 41
M-2
M-3
M-4
Niagara
Kimberly Clark Mill
M-5
Niagara STP Outfall
Portage Falls
US Hwy 8
M-6
Sturgeon Falls
Mg/l
Kremlin
M-7
Pemene Falls
Co Hwy Z
M-8
Mg/l
Co Hwy K
M-9
M-10
M-11
M-12
GREEN BAY
M-13
M-16
M-14
M-15
M-18
M-17
Upper Dam-Marinette
Scott Paper Mill
US Hwy 41
Marathon Paper Outfall
LIGNINS Mg/l
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
STATION "M" NUMBER
TOTAL SOLIDS Mg/l
VOLATILE SOLIDS Mg/l
1800
1650
1500
1350
1200
1050
900
750
600
450
300
150
STATION "M" NUMBER

MENOMINEE RIVER

7 AUGUST 1963

MR. STEIN: Thank you. Are there any comments or questions?

MR. PIERCE: No questions.

MR. STEIN: Thank you.

MR. MUEGGE: We will now call upon the Director of the Committee on Water Pollution, Mr. Wisniewski, for the enforcement actions and orders issued.

Are you going to go into the summary and conclusions?

MR. WISNIEWSKI: Yes.

STATEMENT OF T. F. WISNIEWSKI, DIRECTOR, WISCONSIN COMMITTEE ON WATER POLLUTION

MR. WISNIEWSKI: The Wisconsin Committee on Water Pollution and State Board of Health by initiating action through public hearings and issuance of orders exercise exclusive jurisdiction over the sources of pollution in the Wisconsin portion of the Menominee River drainage area.

Two public hearings have been held: One on October 21, 1953, and one on March 29, 1962. Actions taken following these hearings are detailed below:

Kimberly-Clark Corporation - Niagara

On April 6, 1954, Joint Order 2-54J-13 was issued to the Kimberly-Clark Corporation at Niagara, Wisconsin, requiring provision for proper disposal of sewage, reduction in woodroom wastes and reduction in pollution due to spent sulfite liquor. The sewer system within the mill was rearranged to permit connection of sanitary sewage to the municipal sewers at Niagara. By the end of 1954, facilities were installed to reduce woodroom losses by 60 percent. On May 24, 1956, the Michigan Water Resources Commission issued an Order of Determination authorizing the

Kimberly-Clark Corporation to dispose of substantial quantities of spent sulfite liquor by spray irrigation on land located in Michigan. The spent sulfite liquor spray-soil filtration area and installation of essential handling equipment was completed in August of 1956. The company bases its hauling program on stream sampling with the purpose of maintaining dissolved oxygen in the downstream areas at not less than 3.0 mg/1.

Joint Order 2-63J-1 issued February 13, 1963, requires Kimberly-Clark Corporation at Niagara to continue efficient operation of woodroom and fiber recovery equipment and to develop a plan for additional reduction in the quantity of pollutional matter discharged from the pulp mill by July 1, 1964.

Village of Niagara

On February 13, 1963, Joint Order 2-63J-2 was issued to the Village of Niagara requiring development of a program of reduction of excess clear water discharged to the municipal treatment plant. The report of findings and program for reduction of inflow of clear waters is to be submitted to the State Board of Health by July 1, 1964.

Scott Paper Company - Marinette

T. F. Wisniewski

On April 6, 1954, Joint Order 2-54J-14 was issued to Marinette Paper Company, a wholly owned subsidiary of Scott Paper Company, requiring said company to provide facilities for reducing pollution due to spent sulfite liquor by December 31, 1956. In March of 1957, Scott Paper Company completed construction of spent sulfite liquor collection and distribution facilities. A portion of the liquor is hauled for use as a roadbinder and the remainder is metered uniformly to the river. On February 13, 1963, Joint Order 2-63J-3 was issued to Scott Paper Company requiring a study and plans for additional reduction of pollutional load from the pulp mill to be submitted by July 1, 1964.

City of Marinette

On April 6, 1954, Joint Order 2-54J-15 was issued to the City of Marinette requiring provision for year-around chlorination and for development of a program for separation of storm and sanitary sewers with the report on the proposed program to be submitted on or before December 31, 1955. A report submitted on December 29, 1955, establishes a sewer separation schedule and advises that year-around chlorination of effluent has been provided. A subsequent progress report dated March 29, 1962, reveals that the sewer separation program is progressing through installations made each year.

Ansul Chemical Company - Marinette

On April 6, 1954, Joint Order 2-54J-16 was issued requiring Ansul Chemical Company to construct chemical recovery facilities by December 31, 1956. The chemical recovery facilities were installed as required. In 1962 Ansul Chemical Company discontinued the production operations which were producing wastes and is not considered a source of pollution.

Florence - Unincorporated

On April 6, 1954, Joint Order 2-54J-17 was issued requiring the Town of Florence to install adequate treatment facilities by December 31, 1956, to eliminate discharge of raw sewage to the Brule River. The Town of Florence made application for Federal grant-in-aid under Public Law 660 and awaited receipt of Federal grant before proceeding with construction. A stabilization pond was completed in October 1959 to receive sewage from the community and industrial wastes from Frigo Brothers Cheese Factory. Adequate treatment is being provided.

Wausaukee Cheese Factory - Wausaukee

On April 6, 1954, Joint Order 2-54J-18 was issued to Wausaukee Cheese Factory requiring provision for adequate disposal of wastes to reduce pollution of Wausaukee River by December 31, 1956. Collection facilities were placed in operation in July 1958, from which time the cheese factory is hauling surplus whey and all can washings for disposal on land. Remaining floor drainage has no adverse effect on the Wausaukee River.

As exhibits for this section, we have copied all of the orders that have been issued and have been referred to. I don't think you want to go through the process of reading all of these.

MR. STEIN: This will appear in the record, though.

MR. WISNIEWSKI: All right

(Exhibit I of Part F is as follows:

BEFORE THE

COMMITTEE ON WATER POLLUTION

AND

STATE BOARD OF HEALTH

In the Matter of the Alleged Pollution of)
the Menominee River and its tributaries in)
Florence and Marinette Counties, Wisconsin)

Exhibit F-I

FINDINGS OF FACT, CONCLUSIONS AND ORDER

On the basis of investigations by representatives of the Committee on Water Pollution and State Board of Health which disclosed that polluting substances are being discharged to the Menominee River and its tributaries in Florence and Marinette Counties, Wisconsin, creating conditions hazardous to public health and adversely affecting aquatic life, the Committee on Water Pollution and State Board of Health on March 9, 1962 set the matter for a public hearing which was held in the County Court House, Marinette, Wisconsin, on Thursday, March 29, 1962, commencing at 10:00 A.M.

From the evidence, it appears that representatives of the Committee on Water Pollution and State Board of Health made investigations along the Menominee River and its tributaries to determine sources of pollution and the degree of treatment provided. The effect of discharge of wastes was determined through stream surveys conducted at stations above and below sources of pollution.

Testimony relative to sources of pollution shows that the Menominee River receives untreated wastes from the Kimberly-Clark Corporation, Niagara, and Scott Paper Company at Marinette, and at times receives untreated sewage

Exhibit F-I

by-passed from the sewer systems at Niagara and at Marinette.

From testimony relative to stream surveys conducted above and below sources of pollution, it appears that the discharge of by-passed sewage results in an excessive concentration of sewage bacteria. Further, it appears that the discharge of untreated industrial wastes and by-passed sewage reduces dissolved oxygen concentration in the stream.

Testimony establishes that discharge of untreated sewage constitutes a hazard to public health, and that discharge of untreated sewage and industrial wastes creates conditions deleterious to aquatic life.

Testimony by representatives of municipalities and industries indicates a willingness to comply with recommendations for improvements essential to stream pollution abatement.

Testimony by representatives of the pulp and paper industry discussed provisions made for disposal of wastes at the mills and presented information on the importance and economic value of the industry to the State and local communities.

- - - -

Exhibit F-I

2-63J-1

Kimberly-Clark Corporation - Niagara

Findings of Fact

THE BOARD AND COMMITTEE FIND:

1. That the Kimberly-Clark Corporation, manufacturer of pulp and paper, utilizes the method of hauling spent sulphite liquor for use as roadbinder and for disposal by soil filtration as means of reducing pollution of the Menominee River.

2. That the remainder of the spent sulphite liquor discharged to said stream causes a lowering of dissolved oxygen and contributes to the heavy growth of slimes giving rise to objectionable conditions.

3. That said company provides adequate facilities to reduce woodroom and fiber losses to a practicable minimum.

Conclusions of Law

That the order hereinafter made for reduction of pollution of the Menominee River by wastes from the Kimberly-Clark Corporation at Niagara is reasonable and proper and necessary for the protection of public rights in said stream.

Exhibit F-I

Order

IT IS, THEREFORE, ORDERED:

1. That the Kimberly-Clark Corporation, Niagara, continue efficient operation of its woodroom and fiber recovery equipment.

2. That said company conduct a study and develop plans for additional reduction in the quantity of pollutional matter discharged from the pulp mill to the Menominee River; report of said study and plans for reduction of pollutional matter to be submitted to the Committee on Water Pollution for review on or before July 1, 1964, with this provision being subject to such further order as may be issued following receipt of plans.

3. That said company when it intends to increase the quantity of industrial waste discharging to the Menominee River or when it intends to alter an existing outlet or build new outlet for industrial wastes, shall, before starting such work, advise the Committee on Water Pollution, in writing, concerning its intentions and shall supply to the Committee a general report describing steps which will be taken to protect the waters of the state against new pollution or an increase in existing pollution, said report to be submitted not less than 30 days before approval is

desired, and no construction work shall be started until the report has been approved.

4. That the provisions of this order supplement, and, to the extent that they may be inconsistent therewith, supersede those with respect to the Kimberly-Clark Corporation in the order dated April 6, 1954.

- - - -

2-63J-2

Village of Niagara

Findings of Fact

THE BOARD AND COMMITTEE FIND:

1. That the Village of Niagara provides a primary treatment plant for treatment of sewage originating in the village.

2. That the collecting sewer system is largely of the combined type contributing excessive amounts of storm waters which adversely affect the operation of the treatment plant, and at times necessitate by-passing of untreated sewage.

3. That by-passing of untreated sewage to the Menominee River presents a hazard to public health and

constitutes stream pollution.

Conclusions of Law

That the order hereinafter made for the segregation of storm waters to reduce pollution of the Menominee River at Niagara is reasonable and proper and necessary for the preservation of public health and protection of public rights in said stream.

Order

IT IS, THEREFORE, ORDERED:

1. That the Village of Niagara conduct a study and develop a program for the separation of storm and sanitary sewers so as to reduce by-passing of untreated sewage; the report of findings and program for said separation to be submitted to the State Board of Health for approval on or before July 1, 1964.

- - - -

2-63J-3

Scott Paper Company - Marinette

Findings of Fact

THE BOARD AND COMMITTEE FIND:

1. That the Scott Paper Company, Marinette,

manufacturer of pulp and paper, utilizes the method of hauling spent sulphite liquor for use as roadbinder as a means of reducing the amount of pollutional waste discharged to the Menominee River.

2. That the remainder of the spent sulphite liquor discharged to said stream causes a lowering of dissolved oxygen and development of slime growths which give rise to objectionable conditions and constitute stream pollution.

3. That said company provides efficient savealls to reduce discharge of fiber to a practicable minimum.

Conclusions of Law

That the order hereinafter made for reduction of pollution of the Menominee River by wastes from the Scott Paper Company at Marinette is reasonable and proper and necessary for the protection of public rights in said stream.

Order

IT IS, THEREFORE, ORDERED:

1. That the Scott Paper Company, Marinette, conduct a study and develop plans for additional reduction in the quantity of pollutional matter discharged from the pulp mill to the Menominee River; report of said study and

Exhibit F-I

plans for reduction of pollutional matter to be submitted to the Committee on Water Pollution for review on or before July 1, 1964, with this provision being subject to such further order as may be issued following receipt of plans.

2. That said company when it intends to increase the quantity of industrial waste discharging to the Menominee River or when it intends to alter an existing outlet or build a new outlet for industrial wastes, shall, before starting such work, advise the Committee on Water Pollution, in writing, concerning its intentions and shall supply to the Committee a general report describing steps which shall be taken to protect the waters of the state against new pollution or an increase in existing pollution; said report to be submitted not less than 30 days before approval is desired, and no construction work shall be started until the report has been approved.

3. That the provisions of this order supplement, and, to the extent that they may be inconsistent therewith, supersede those with respect to the Scott Paper Company in the order dated April 6, 1954.

All of the foregoing orders, numbered 2-63J-1 to 2-63J-3, inclusive, dated at Madison, Wisconsin, this 13th day of February, 1963.)

* * *

Exhibit F-II

(Exhibit II of Part F is as follows:

Orders Issued April 6, 1954

2-54J-15

City of Marinette

Findings of Fact

THE BOARD AND COMMITTEE FIND:

1. That the City of Marinette provides a primary plant for treatment of sewage and is accomplishing a satisfactory reduction in strength of wastes.

2. That effluent from said treatment plant is disinfected during the summer months.

3. That during the remainder of the year, effluent is discharged without disinfection to the Menominee River which flows into Green Bay from which the City of Marinette obtains its water supply.

4. That the sewer system is a combined system contributing excessive amounts of storm waters which necessitates by-passing of untreated sewage.

5. That said discharge of effluent without disinfection and by-passing of untreated sewage presents a hazard to public health and constitutes stream pollution.

Conclusions of Law

Exhibit F-II

That the order hereinafter made for the segregation of storm waters and disinfection of effluent to reduce pollution of the Menominee River at Marinette is reasonable and proper and necessary for the preservation of public health and for the protection of public rights in said river.

Order

IT IS, THEREFORE, ORDERED:

1. That the City of Marinette provide for year-around disinfection of effluent.

2. That said City conduct a study and develop a program for the separation of storm and sanitary sewers to reduce by-passing to a minimum; the report of findings and program for said separation to be submitted to the State Board of Health for approval on or before December 31, 1955.

3. That satisfactory progress reports shall be submitted from time to time as required by the Committee on Water Pollution.

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2-54J-16

Ansul Chemical Company - Marinette

Exhibit F-II

Findings of Fact

THE BOARD AND COMMITTEE FIND:

1. That the Ansul Chemical Company, manufacturer of chemical products at Marinette, discharges untreated industrial waste to the Menominee River.

2. That said discharge contains excessive concentrations of sulphates and is sufficiently acid to adversely affect aquatic life.

3. That said company in 1952 started construction of a plant to reclaim the waste chemicals and is planning to complete construction within two years.

Conclusions of Law

That the order hereinafter made for the reduction of pollution of the Menominee River by wastes from the Ansul Chemical Company at Marinette is reasonable and proper and necessary for the protection of public rights in said river.

Order

IT IS, THEREFORE, ORDERED:

1. That the Ansul Chemical Company complete

construction of chemical recovery facilities not later than December 31, 1956.

2. That satisfactory progress reports shall be submitted from time to time as required by the Committee on Water Pollution.

- - - -

2-54J-17

Florence - Unincorporated

Findings of Fact

THE BOARD AND COMMITTEE FIND:

1. That the Town of Florence, Florence County, Wisconsin, permits the discharge of sewage from private premises in the unincorporated area of Florence to a sewer system through which it is conveyed to the Brule River.

2. That said discharge of untreated sewage presents a hazard to public health and constitutes stream pollution

Conclusions of Law

That the order hereinafter made for the provision of adequate sewage treatment facilities at Florence to reduce pollution of the Brule River is reasonable and proper and necessary for the preservation of public health and protection of public rights in said river.

Order

IT IS, THEREFORE, ORDERED:

1. That the Town of Florence, Florence County, on or before December 31, 1956, provide for elimination of the discharge of raw sewage to the Brule River by installing adequate treatment facilities in accordance with plans approved by the State Board of Health.

2. That satisfactory progress reports shall be submitted from time to time as required by the Committee on Water Pollution.

- - - -

2-54J-18

Wausaukee Cheese Factory - Wausaukee

Findings of Fact

THE BOARD AND COMMITTEE FIND:

1. That the Wausaukee Cheese Factory, Wausaukee,

Exhibit F-II

manufacturer of dairy products, discharges untreated industrial wastes to the Wausaukee River.

2. That said discharge of untreated industrial wastes constitutes stream pollution.

Conclusions of Law

That the order hereinafter made for the provision of adequate treatment facilities to reduce pollution of the Wausaukee River by wastes from the Wausaukee Cheese Factory is reasonable and proper and necessary for the protection of public rights in said river.

Order

IT IS, THEREFORE, ORDERED:

1. That the Wausaukee Cheese Factory complete construction of adequate industrial waste treatment facilities in accordance with approved plans not later than December 31, 1956.

2. That satisfactory progress reports shall be submitted from time to time as required by the Committee on Water Pollution.)

* * *

MR. STEIN: Do we have any comments or questions?

MR. WISNIEWSKI: If they want to ask questions or comment on this portion, I will be glad to answer.

MR. STEIN: I have one comment and one question. The comment is on your first sentence, and I would just like to note this for the record, unless you want a discussion.

You say that,

> "The Wisconsin Committee on Water Pollution and State Board of Health by initiating action through public hearings and issuance of orders exercise exclusive jurisdiction over the sources of pollution in the Wisconsin portion of the Menominee River drainage area."

I think so far the discussions here have indicated there may be some other views on that.

MR. WISNIEWSKI: The Wisconsin statute provides that when the Committee on Water Pollution or State Board of Health, or both, take action with reference to a source of pollution, they have exclusive jurisdiction, regardless of any other statute.

MR. STEIN: This is true, but I was talking in terms of Federal jurisdiction.

MR. WISNIEWSKI: You can discuss that with the attorneys.

MR. STEIN: That's right. I don't think we should discuss this here, unless you want to.

I just want to note this for the record, that this is stated in the report, and there may be a difference.

I have a question.

MR. WISNIEWSKI: Yes.

MR. STEIN: On the next page, when you talk about the City of Marinette, they have a report for the separation of storm and sanitary sewers establishing a sewer separation schedule, and so forth.

Now, no place has it been specified yet what thi schedule is, except that satisfactory progress is being made.

MR. WISNIEWSKI: Our schedule is available in the files of the State Board of Health, and it is available at the Public Director's office.

MR. STEIN: When will the storm separation be completed. Do you know

MR. WISNIEWSKI: You can get that answer from the City of Marinette.

MR. STEIN: All right. Thank you.

MR. MUEGGE: Will you proceed with the summary and conclusions?

MR. WISNIEWSKI: The Wisconsin State Board of

Health and Committee on Water Pollution, having taken jurisdiction with reference to sources of pollution of the Menominee River and its tributaries in Wisconsin, are proceeding according to law and now exercise exclusive jurisdiction over Wisconsin sources of pollution.

Strict interpretation of the Federal Water Pollution Control Act in relation to court decisions relative to Federal powers over interstate waters raises a question of constitutionality of said Act.

All Wisconsin sewage treatment plants in the Menominee River drainage area are operating satisfactorily. The Village of Niagara and City of Marinette have been required to develop clear water separation programs to further improve operation of the sewerage systems.

The Marinette raw water supply analyses show coliform counts well below the accepted values reported by the United States Public Health Service as a desirable maximum. Finished water supply is consistently safe.

The public bathing beaches at Marinette have been used by numerous people, and so far as is known there has been no adverse effect on the health of beach users.

Significant loadings of pollutional wastes are discharged to the Menominee River by the Kimberly-Clark Corporation at Niagara and the Scott Paper Company at

Marinette.

Stream surveys reveal that control measures practiced by the pulp and paper mills tend to reduce the effect of wastes on dissolved oxygen reduction. However, plankton studies reveal development of slime growths which have an adverse effect on stream uses.

Joint orders issued by the State Board of Health and Committee on Water Pollution require the pulp and paper industries to develop plans for further reduction of pollution within a specified time. All other sources of pollution which present a problem are also under orders requiring abatement.

In view of the jurisdiction exercised by State authorities, pollution has been reduced and will continue to be reduced through application of State efforts. It is, therefore, believed that adequate control is being exercised over sources of pollution in the Menominee River drainage area.

MR. STEIN: Are there any comments or questions?

MR. PIERCE: No comments.

MR. OEMING: No questions.

MR. SCHNEIDER: Well, I don't want to belabor that point of the desirable maximum of the United States Public Health Service. We settled that yesterday, but it does appear here.

MR. STEIN: And also again is repeated, Mr. Wisniewski, this question of exclusive jurisdiction.

I think we discussed this constitutional privilege yesterday, about the law being unconstitutional, and this has been argued.

I didn't quite expect the other argument, which we received from some States, very few, in the past, about once a State acts under State law it has exclusive jurisdiction, despite the Federal statute.

Generally, this theory is known as interposition in the law. I don't know how much success it has had recently.

MR. MC DERMOTT: No interposition argument has been made here, not by Mr. Wisniewski. We are not making that argument.

MR. STEIN: All right.

MR. WISNIEWSKI: We are simply indicating that under our statutes, when we take action, we have exclusive jurisdiction regardless of any other statutes.

MR. STEIN: Within the State?

MR. WISNIEWSKI: Yes.

MR. STEIN: Yes. We would certainly agree with you.

Thank you.

Mr. Muegge?

MR. MUEGGE: I just want to point out that the report that we have presented indicates that the State Board of Health and the Committee on Water Pollution have recognized our pollution problems in the Menominee River Basin and have taken steps to bring about the correction.

This report is being received as an exhibit, is it not?

MR. STEIN: Well, it will be received as read. It will be more than an exhibit. The exhibits and everything will appear as if Mr. Wisniewski and the other people read them.

MR. MC DERMOTT: All right.

MR. MUEGGE: We would, however, like to include as an exhibit, to indicate the more detailed studies that have been made that have resulted in the issuance of orders in 1963, this report which is entitled "Report on an Investigation of the Pollution of the Menominee River and its Tributaries in Wisconsin Made During 1961 and Early 1962," entered as an exhibit.

MR. STEIN: Would you want that printed in the record at this point, or just entered in the files as an exhibit?

MR. MUEGGE: Yes, we would like to have it included in the record.

MR. STEIN: Without objection, it will be received.

(The report referred to is as follows:

March 13, 1962

REPORT ON AN INVESTIGATION OF THE POLLUTION OF THE MENOMINEE RIVER AND ITS TRIBUTARIES IN WISCONSIN MADE DURING 1961 AND EARLY 1962

GENERAL INFORMATION

Drainage Basin:	Menominee River Drainage Basin 16
Area Surveyed:	Main and tributary streams of the Menominee River in Wisconsin.

DRAINAGE AREA AND USES

The Menominee River has a total drainage area of 4,186 square miles, of which 1,510 square miles are in Wisconsin. The major tributaries to the main stream include the Brule River, with a size of 1,128 square miles, the Pine River, draining 573 square miles and the Pike River, with a drainage basin of 286 square miles. Of these tributaries mentioned, the Pike and Pine Rivers lie wholly in Wisconsin. The Brule River originates in Michigan and with the Menominee River forms part of the northeast State boundary.

The drainage area within Wisconsin has a maximum length of about 95 miles, is oriented to the southeast and discharges into Green Bay at Marinette. All of Florence County, over 1/2 of Marinette County, about 1/3 of Forest County and the northeast corner of Vilas County are within the drainage basin. In general, the area is hilly and represents an overall difference in elevation of over 1,300 feet. Nine power dams are located on the Menominee and one each on the Brule and Pine Rivers to utilize the head and flow for generation of electrical energy. Some use is made of surface water in the area for municipal and industrial purposes. At Niagara, Kimberly-Clark Corporation and at Marinette, Scott Paper Company and Ansul Chemical Company use surface waters. Marinette obtains its municipal supply from the Bay. Soil in the upper portion of the drainage basin is largely composed of sand and gravel with occasional rock outcroppings. In the lower part of the drainage area soil is more sandy and somewhat calcareous.

The United States Geological Survey has operated four gauging stations on the Menominee River for which detailed records are available. Twin Falls, near Iron

Mountain, Michigan is the farthest upstream station and has a drainage area of 1,790 miles. Forty years of records indicate 95% of the time the flow exceeds 726 cubic feet per second. Duration tables are only available covering four years' data at the Pembine station which drains an area of 3,240 square miles. Forty-one years of flow data below Koss, Michigan show a 95% flow of 1,020 cubic feet per second from the 3,790 square miles of drainage area. The farthest downstream gauging station was east of McAllister and intercepted about 96% of the total drainage basin. Nine years of records indicate a 95% flow of 1,320 cubic feet per second. This station was discontinued in 1961. Of the gauging stations mentioned, it appears that the Koss data, which is over an extended period and the most conservative, could best be used for estimating low flow at Niagara and Marinette. Application of the runoff rate at Koss to the 2,604 square miles of drainage area at Niagara would indicate a 95% flow of 700 cubic feet per second. Similarly, translation of the runoff rate to the 4,180 square miles of drainage area at the lower Marinette Dam would indicate a 95% flow of 1,130 cubic feet per second. Forty years of records for the gauging station at Amberg, on the Pike River, show a 95% flow of 91 cubic feet per second for the 253 square miles of drainage area. The Pine River at the Pine River Power Plant near Florence experiences a 95% flow of

105 cubic feet per second for the 528 square miles of drainage area. Data from these gauging stations indicate the streams in these areas have comparatively good flows even during the periods of extended dry weather. Flow data for 1961 is not yet available. Precipitation data at Marinette for the months of June through September, 1961, totaled 15.96 inches or 3.32 inches above the long-term normal. We would expect, therefore, that stream flow and dilution were also above normal and our survey findings indicating somewhat better conditions than would occur during periods of normal and low flow.

The area relies heavily on its water and woodland resources. There is a limited amount of farming. Although virgin timber stands have been virtually depleted, lumbering and pulp logging activities play a major role in the area's economy. The drainage basin contains many lakes and streams and offers recreational facilities, including hunting, fishing, swimming, camping and canoeing. Many of the tributary streams are classified as trout waters by the Conservation Department. The Menominee and parts of the Pike and Pine Rivers are considered as small-mouth bass streams. Recreational use of the land and water areas is expected to be of increasing importance.

Marinette, with a 1960 population of 13,329, is the largest city in the area and is followed in size by the Village of Niagara with a population of 2,098. Outside of Marinette itself, the area has a low population density.

A pollution investigation and hearing was previously conducted in this area in 1953. As a result and with the cooperation of the municipalities and industries involved, improvements have been made.

SOURCES OF POLLUTION AND SURVEY FINDINGS

Sources of wastes discharging to surface waters within the area are shown in Table 1, which is attached. The listing of each source follows an orderly sequence showing first those on the main stream from headwaters to mouth followed by those of consecutive tributaries going downstream. The mileages given show the location of the tributary or pollution source on the receiving stream as distances from the stream's mouth. The number of each source is used also to locate it on the attached map. Detailed stream survey results for the entire drainage area are tabulated in Table 2. Table 3 is a summary of cooperative stream survey data obtained by Scott Paper Company at Marinette and Kimberly-Clark Corporation at Niagara and the Committee on Water Pollution in regard to stream conditions on the Menominee River in the vicinity of each of the mills. A description of each waste source follows:

Kimberly-Clark Corporation, on the Menominee River at Niagara, produces groundwood and sulphite pulp and manufactures paper. As a result of the 1953 hearing and investigation, Order 2-54J-13 was issued. The industry has responded by limiting production and hauling out of spent sulphite liquor for roadbinder or to be sprayed onto the land. During 1961, up to October 25, a total of 620,000 gallons had been hauled out for roadbinder. In addition, saveall recovery and reuse of whitewater to some extent is practiced to reduce fiber losses. Table 3 shows that the minimum dissolved oxygen found below the mill this past summer was 4.0 mg/1, which was also the lowest for the past five years. Although this is the largest source of pollution in the drainage area in terms of biochemical oxygen demand loading, the stream below has a high reaeration capacity and conditions critical for fish life have not developed in recent years. There is, however, an abundant growth of slime in the stream for some distance below the mill as well as a change in bottom organisms resulting in a polluted classification for this section from the biological standpoint.

The Village of Niagara completed construction of a primary sewage treatment plant in 1959. The sewer system is largely of the combined type, and therefore, bypassing of raw sewage occurs during periods of surface water runoff. In order to eliminate this problem, a program should be established for separation of storm and sanitary sewers. A certain amount of construction should be done each year leading ultimately to eventual separation of the systems.

Scott Paper Company operates a paper mill and sulphite pulp mill on the Menominee River at Marinette. As a result of the 1953 investigation and hearing, Order 2-54J-14 was issued. In the paper making operations the company uses savealls and some reuse of whitewater to decrease fiber loss. Recent improvements in the pulp mill have resulted in the collection of a higher spent sulphite liquor solids concentration and some of this liquor is hauled out as roadbinder. During 1961, a total of 310,800 gallons was diverted for this purpose. Table 3 shows that the minimum dissolved oxygen concentration found below the mill this summer was 3.2 mg/1, which was also the minimum found during the past five years. While this concentration is not considered critical to fish life, there is considerable slime growth in the stream and fiber, wood chips, fungus, and the composition and population of bottom organisms results in a polluted classification of the stream below the mill. Scott Paper Company is only three miles from the Bay and there is insufficient flow time for the biochemical oxygen demand to substantially reduce dissolved oxygen. However, high loadings reaching Green Bay during winter months with an ice cover could result in the development of local critical conditions in the latter body.

The City of Marinette has a primary sewage treatment plant with provision for disinfection of effluent by chlorination. The effluent line from the plant is overloaded, and a portion of the effluent is directed to a stagnant slough connected to the Menominee River. This slough is grossly polluted at times, and the resulting nuisance has been the object of complaints. It appears that some raw sewage may also be bypassed to this slough at times. A study of the effluent sewer should be made, and the required revisions should be carried out to provide for discharging all effluent to a point in the river where adequate dilution will be provided. It is understood that approximately 1/3 of the city is now served by separate sewers, the remaining portion of this system being of the combined type. In response to Order 2-54J-15, a report on a proposed sewer separation program was submitted to the Board on January 13, 1956. It is essential that this separation program be carried out as rapidly as possible in order to minimize bypassing of raw sewage to the Menominee River.

The M and M Light and Traction Company operated a gas plant on the Menominee River at Marinette which at times was considered a source of pollution due to discharge of oils and phenol. Natural gas was made available in the fall of 1960 and consequently gas manufacturing has been discontinued. Ansul Chemical, also at Marinette, manufactures methyl chloride. In 1953, they had an acid waste problem and Order 2-54J-16 was issued. A recovery plant was completed in 1955 and they are now able to recover a large percentage of acid sulphate. Neither of these two industries are currently considered as sources of pollution.

The community of Florence constructed a sewage stabilization pond in 1959 in response to Order 2-54J-17, which required adequate treatment facilities. This pond also receives waste from the Frigo Brothers Cheese Plant, and it has been reported that whey and other strong wastes are discharged from this plant at times. Objectionable odors have been reported in the vicinity of the pond and the community. It appears that the odor problem is associated with the high strength wastes discharged from the milk processing plant. In order to minimize the development of odors, it is essential that every effort be made by the industry to prevent the discharge of strong wastes such as whey to the sewer system. Unless industrial wastes from this plant are properly controlled, it is probable that a serious odor nuisance will continue.

The unincorporated Village of Goodman is served by a trickling filter type plant which was constructed in 1948. Periodic observation has revealed this plant to be performing satisfactorily.

The Wausaukee Cheese Company (Pauly Cheese Company) located at Wausaukee on the Wausaukee River manufactures American cheese. The factory was considered as a source of pollution in 1953 and Order 2-54J-18 was issued. To comply with the order this industry has been hauling out their concentrated wastes which includes the whey and can washings for land disposal. Floor drains discharge to the stream, which provides relatively high dilution for the wastes involved. Stream surveys show no appreciable effect on the biochemical oxygen demand or the dissolved oxygen, but there was somewhat of an increase in the bacteriological density. Continued hauling out of strong wastes or other suitable disposal so as to prevent stream pollution and a nuisance is believed necessary.

BIOLOGICAL INVESTIGATIONS

Samples of bottom material for biological examinations were collected on July 31 and August 1, 1961, from the Menominee River, extending from the Niagara area down to and including the Marinette area. Aquatic plants and animals provide a more or less static record of the prevailing stream conditions and essentially are not affected by a temporary amelioration nor usually by a transient deterioration resulting from a waste discharge. A biological survey is a study of stream ecology -- a study of stream conditions as they affect growth and production of biological life within a given community of the stream. The study in this particular survey has been limited to the bottom-dwelling fauna or those organisms which live within or upon the bottom deposits of the stream. Most of these organisms have life histories which range up to or exceed one year in length and, therefore, depict the long-term effect.

Clean waters support a wide variety of organisms. These are exacting in their habitat requirements and may be affected and controlled in their production by several aquatic factors. These factors include dissolved salts, the speed of the current, the temperature of the water, the dissolved oxygen in the water, the physical nature of the stream bed, and the frequency and magnitude of flooding. Normal changes in temperature, light, dissolved oxygen, and food supply tend to result in shifts in the population picture. These shifts, however, are rarely great because predation, death, and growth moderate the changing tendency and keep the biotic society in balance. Physical stream conditions such as changes in the rate of flow, variation in the depth of water, and changes in the physical stream bottom caused by the deposition of silt and other particulate matter over the rubble, also affect quantitative and qualitative distribution of bottom-dwelling species. The diversity of biological life normally decreases from rubble through gravel, gravel and sand, muck, and pure sand as the number and variety of utilizable living spaces decrease. The distribution of various species on the different types of bottom is related to the habitat preference of the species and is associated with physical adaptations in the organism itself.

Bottom-dwelling organisms by virtue of their habitat preference and their poorly developed method of locomotion are directly subjected to any substance which may enter their habitat. Normally there is competition and interaction among the many varieties present for the available food and space. However, different organisms respond in a different manner to any changes which may take place. Some species cannot tolerate any appreciable pollution, whereas others tolerate varying degrees of pollutional material and some are very tolerant and display an ability to live and multiply under extremely adverse conditions. Within this general category there exist variations and gradations of tolerance toward adverse conditions as exhibited by the many families, genera, and species of bottom-dwelling forms encountered. When the number of some organisms are reduced or eliminated because of intolerance, the few surviving varieties are able to multiply in great numbers thus filling the created void and consuming the available food supply. Thus, it is possible through a consideration of the interrelationships of all of the organisms living within a particular stream community to determine this effect and categorize the response of a particular stream area to water quality.

The procedure for such an investigation consists in collecting qualitative and quantitative bottom samples by means of specialized stream sampling devices which sample a unit area of bottom. The bottom material is washed with water and passed through a U. S. Standard No. 35 Sieve which retains the organisms and larger debris. The organisms and debris obtained in the field collections are preserved in formalin for later identification and enumeration in the laboratory.

Samples of bottom deposits for an examination of bottom-dwelling biota were taken approximately one-half mile above Horseshoe Rapids which is about 5½ miles above Niagara. Samples were taken on the left side of the main current of the stream (as one faces downstream) from a sandy-loam bottom and a water depth of approximately 12 feet. Seven varieties of organisms were isolated at this point, two of which are considered intolerant to organic wastes, four are tolerant, and one very tolerant. A total population slightly exceeding 1,300 organisms per square foot was found. Sludge worms were quite numerous.

Below Horseshoe Rapids near the neck of Upper Quinnesec flowage, from a depth of water approaching 45 feet and a sand and gravel bottom, the overall bottom population was reduced to 113 organisms per square foot but seven species were in evidence. Sludge worms predominated in the population; however, burrowing mayfly nymphs, caddisfly larvae, and gill-breathing snails were found to exist in the area signifying an adequate oxygen supply. Compared to a 1956 survey in this same area, the present bottom conditions are much improved. In the 1956 survey, sludge worms existed in a population exceeding 12,000 per square foot. In the 1956 survey also, only two species were found to exist in the bottom material as opposed to the seven species which were found during the current study. This would suggest a return to normal bottom conditions in the area.

A sample from the Niagara flowage approximately one mile above the dam from a sand and gravel bottom revealed 10 different kinds of organisms and a total population of 400 per square foot. The dominant organism was the fingernail clam. Three species of intolerant forms were found in the samples, and the bottom-dwelling community appears to be normal for the type of environment from which the sample was collected.

The next station was located about 0.2 mile below the mill at Niagara. The sample was taken by wading out into the stream from the right bank as one faces downstream. The current was swift in the area sampled, the bottom gravel supported only two varieties of bottom-dwelling fauna consisting of sludge worms and a very tolerant midge larvae. Sewage fungus, Sphaerotilus natans, was observed floating downstream and was attached to bottom materials and shoreline debris. The total population in this area was quite small but was about of the same magnitude as observed in 1956. Bottom conditions are apparently such as to inhibit the development of a large population of organisms of even the very tolerant varieties.

A sample just below Sand Portage Falls, approximately two miles above the Highway 8 bridge revealed a tremendous population (36,000 per square foot) of tolerant midge larvae along with a few sowbugs and tolerant leeches. There was some fungus floating downstream in the general area. Rock scrapings in the region of the falls itself revealed the same type of biota as was observed in the bottom sample. The sample was collected from a region approximately 2½ miles below the Niagara mill.

In the region of Sturgeon Falls some five miles farther downstream, a bottom sample from a gravel bar revealed as many as 12 varieties of bottom biota with an overall population slightly in excess of 400 per square foot.

Intolerant organisms observed included one specie of caddisfly larvae and a riffle beetle. The fresh water sponge, Spongilla lacustris, was found growing on some of the bottom formations within this area. Although the general region from the physical appearance of the stream bottom should be productive of caddisfly larvae and stonefly nymphs, the bottom biota indicated at least a partial return to near normal conditions.

Some 8½ miles downstream in the region of Kremlin Falls. (approximately 16 miles below the mill) rocky bottom revealed as many as 13 varieties of organisms in the sample with a population approximating 200 per square foot. Five of the varieties encountered, which composed the bulk of the total population, were composed of those forms which are considered intolerant toward organic wastes. Thus, it appears that a balanced bottom-dwelling biota exists at this location. Similarly at the County Trunk "Z" crossing an additional 6.6 miles downstream and some 23 miles below the Niagara mill, 14 varieties of bottom-dwelling biota were isolated from the collected sample, and 8 of these are known to be intolerant toward organic wastes. Stonefly nymphs, caddisfly larvae, riffle beetles and fishfly larvae were noted at this location.

Biological samples were also taken in the region of Marinette, Wisconsin. Previously samples were taken in this general region on August 14, 1957. Cross-section bottom samples were taken above the upper dam in Marinette just below the old ice house. The bottom of the stream in this region was composed principally of sand, the depth of water was around 12 feet, and the organisms encountered included caddisfly larvae, burrowing mayfly nymphs and beetle larvae which are known to be intolerant toward organic wastes, midge larvae, sowbugs and fingernail clams which are tolerant, and an occasional very tolerant sludge worm and midge larvae. In general, five to seven varieties of organisms were encountered for a total population of 30 to 75 organisms per square foot. For the physical conditions present at this sampling point, the biota was normal.

One-fourth mile above the first dam or halfway between the Scott Paper Mills, a bottom sample from gravel and sandy loam material near the right side of the stream as one faces downstream contained a relatively small population of tolerant and very tolerant midge larvae and sowbugs. The bottom was composed of chips, wood fibers and sewage fungus, Sphaerotilus natans. Long wood fibers were noted on microscopic examination. Some of the wood chips encountered measured 4½ inches long by 3/8-inch in width. This area is located on the same side of the stream as the mill discharge. On the left side of the stream, the bottom population consisted of burrowing mayfly nymphs and midge larvae. Burrowing mayfly nymphs made up slightly over half of the total population encountered in this region and is suggestive of the same type of bottom condition present in the region upstream from the suspected source of pollution.

Going downstream below the Interstate bridge, there was much fiber, fungus, and wood chips covering the bottom deposits and the organism population was composed of very tolerant leeches, very tolerant midge larvae, and a tolerant midge. Globular masses of Sphaerotilus natans were encountered resting on the bottom sludge as well as floating downstream in the water. The bottom fauna at this point is indicative of polluted conditions. Near the river's mouth below Ansul Chemical Company, bottom conditions were apparently such that few if any organisms could exist. No bottom-dwelling biota were encountered in the samples collected. However, long wood fibers, bark, and Sphaerotilus natans were found intermingled in the bottom sludge and deposited over those areas of natural sand bottom.

CHEMICAL

The data pertinent to the condition of the several watercourses concerned is tabulated in Table 2, attached. The analytical information presented follows the same system of organization as employed for Table 1. Results obtained for a single source of waste are grouped following the number and name of such source. Mileage figures for sampling stations used are related to mileage designation for sources of pollution.

Samples were collected by representatives of the Committee on Water Pollution at the stations shown. Determinations were made of temperature, pH and dissolved oxygen (D.O.) at the time of sample collection. Determination of biochemical oxygen demand (B.O.D.), solids, and bacteriological M.P.N. per 100 ml. of water were made by the State Laboratory of Hygiene. Definitions of terms used are appended to this report.

DISCUSSION

The discharge of fermentable organic wastes to a confined surface water results in the development of a degree of pollution dependent primarily on the oxygen requirements of such wastes and the amount of dissolved oxygen available in the receiving waters. Where the organic loading, expressed as biochemical oxygen demand, exceeds the self-purification capacity of the stream, critical and zero dissolved oxygen concentrations develop at downstream locations. This condition creates an environment unsuitable for fish and other clean water forms of aquatic life, renders water unfit for general recreational purposes and undesirable for stock-watering. Under high loadings the water may have a dark appearance, be septic and give off offensive odors. The zone of decomposition extending below any sewer discharging such wastes exhibits characteristic chemical-physical-biological phenomena which may be measured by analyses of stream water and biological samples taken above and below such sources of waste.

Biochemical oxygen demand is a measure of the amount of oxygen utilized by fermentable organic matter in undergoing decomposition. For a given section of stream the biochemical oxygen demand -- dissolved oxygen relationship is controlled by temperature, time, reaeration and concentration. When the temperature of a water is increased, its ability to hold oxygen is decreased. With increased stream temperature, decomposition proceeds at a more rapid rate and the point of low dissolved oxygen will be found nearer the point of discharge. Conversely, with cold water temperatures the rate of decomposition is slowed up and the zone of low dissolved oxygen is farther downstream from the pollution source. For a given biochemical oxygen demand loading and open stream waters, critical oxygen conditions are less likely to occur because of the higher initial dissolved oxygen and improved reaeration capacity. With ice cover, much of a stream's reaeration ability may be lost and critical conditions can develop at a substantial distance from the pollution source.

While untreated and insufficiently treated sanitary sewage possesses the same dissolved oxygen consuming properties as organic industrial waste, such sewage also contains bacteria of intestinal origin which may create a public health hazard for persons coming in contact with waters receiving such waste.

The discharge of an undesirable level of settleable and suspended solids causes the formation of sludge and sediment deposits on the stream bed, interfering with the development of normal biological life of the stream. Soluble organic solids promote slime growths which attach themselves to the stream bottom and vegetation. Slime growths create an unsightly condition and interfere with the habitat of fish food organisms.

CONCLUSIONS

From a consideration of the foregoing information, it may be concluded that the Menominee River under present loading is able to maintain dissolved oxygen concentrations above a level considered critical to fish life but that slime, bottom deposits and organisms indicate polluted conditions below Marinette and Niagara due to industrial wastes. Sanitary hazards exist on the downstream side of these municipalities due to clear water mixed with the sewage. Weber Creek, below Florence, receives excessive pollution due to high industrial waste loading which, in addition, results in odors from the latter community's stabilization pond.

Adequate corrective measures should be taken by the municipalities, industries and others to correct unsatisfactory stream conditions.

Respectfully submitted,

/s/ F. H. Schraufnagel
Assoc. Public Health Engineer

/s/ L. A. Montie, Director
Division of Public Sewerage

/s/ James Lissack
Drainage Basin Engineer

/s/ Kenneth M. Mackenthun
Biologist

(The tables and map attached to the report are as follows:)

Table 1

Menominee River in Wisconsin

Drainage Basin 16

No.	Source or Stream	Miles	Type of Waste	Treatment	Discharged to Stream per day Gallons	Lbs. 5-day B.O.D.
	MENOMINEE RIVER - MAIN STEM					
	Brule River	114.3				
1	Kimberly-Clark Corp.	85.1	Pulp & Paper	See Narrative	10.2 MG	23.82 tons
2	Niagara, Village of	83.9	Sewage	Primary	528,000	250
	Pike River	48.5				
	Wausaukee River	42.3				
3	Scott Paper Company	2.9		See Narrative	6.5 MG	18.06 tons
4	Marinette, City of	1.4	Sewage	Primary	3.00 MG	1,670
	Green Bay	0.0				
	BRULE RIVER - WEBER CREEK					
5	Florence, Uninc.	3.0	Sew. & I.W.	Lagoon	100,000	100
	a-Frigo Bros. Cheese Corp.					
	Brule River	0.0				
	PIKE RIVER - SO. BRANCH - CHEMICAL CREEK					
6	Goodman, Uninc.	43.2	Sewage	Secondary	21,000	13
	Pike River, So. Br.	0.0				
	WAUSAUKEE RIVER					
7	Wausaukee C. F.	4.1	Milk	Hauling		
	Menominee River	0.0				

Table 2

MENOMINEE RIVER IN WISCONSIN

DRAINAGE BASIN 16

MENOMINEE RIVER - MAIN STEM

No. Waste Source	Date	Sample Source	Miles	D.O. (mg/l)	B.O.D. (mg/l)	T (°C)	pH	MPN (Per 100 ml)
	11-1	Storm sewer outfall	87.5+	-	283	13	-	24,000,000
	7-31	U.S. 141 bridge	87.5	6.1	1.4	25	7.5	9,300
1 Kimberly-Clark Corp.	11-1		85.1	10.1	1.2	7	6.8	46,000
	7-31	Offshore	84.8	6.1	3.2	24	7.2	43,000
	11-1			8.5	17.6	7.5	6.9	9,300
2 Niagara, Vil. of	5-16	S.T.P. outfall	83.9	-	43.5*	9.5	7.5	-
	8-1			7.7	18.9	14.5	7.4	-
	7-31	U.S. 8 bridge	81.1	7.3	2.4	23	7.5	110,000
	11-1			10.0	7.2	7	6.6	4,300
	8-1	Below Sturgeon Falls	77.2	5.6	2.4	22	7.3	93,000
	11-1			9.4	5.7	7	7.1	9,300
	8-1	Above Kremlin Falls	68.7	5.5	1.5	21.5	7.3	3,900
	11-1			8.8	3.3	6.5	7.1	9,300
	8-1	CTH "Z" bridge	62.3	7.2	1.2	21	7.4	9,300
	11-1			10.6	1.8	7	7.4	2,400
	8-1	Above upper dam	3.5	6.2	1.1	22.5	7.5	7,500
	11-6			11.1	2.2	5	7.4	930
3 Scott Paper Co.		Upper mill	3.0					
	8-1	Storm sewer outfall	2.9	-	6.8	20	7.4	43,000
	8-1	Between mills	2.5	6.1	3.8	22	7.4	-
	11-6			10.3	9.3	5.5	7.3	9,300
		Lower mill	2.3					
	8-1	U.S. 41 bridge	1.7	6.9	3.4	23.5	7.4	930
	11-6			11.3	4.1	5.5	7.4	7,500
4 Marinette, City of	12-12	(1960) S.T.P. outfall	1.2	7.0	68.3*	12	7.0	-
	11-6			4.6	85.9	12	7.2	-
	8-1	Below Ansul Chemical	1.0	6.2	5.4	23	7.2	110,000

No. Waste Source	Date	Sample Source	Miles	D.O. (mg/l)	B.O.D. (mg/l)	T (°C)	pH	MPN (Per 100 ml)
	11-6	Ogden St. bridge	0.3	11.4	3.6	5.5	7.3	9,300
	11-6	Red Arrow beach	0.0	11.9	3.3	5	7.4	9,300
		WEBER CREEK						
5 Florence, Uninc.	1-24	(1962) Lagoon outlet	3.0	1.1	23.8	1	7.2	930,000
		CHEMICAL CREEK						
6 Goodman, Uninc.	10-31	Above	43.2+	7.7	2.3	9	7.3	46,000
	1-10	(1962)		7.3	24.3	3.5	7.4	24,000
	10-31	S.T.P. outfall	43.2	5.3	22.3	13.5	7.4	-
	1-10	(1962)		6.2	16	10	7.3	-
	10-31	Town road below	43.0	7.8	5.4	9	7.3	24,000
	1-10	(1962)		7.0	13*	3.5	7.2	240,000
		WAUSAUKEE RIVER						
7 Wausaukee C. F.	10-31	Town road above	4.1+	11.4	3.5	9	7.2	2,100
	1-10	(1962)		13.0	1.4	1	7.4	750
	10-31	Outfall	4.1	6.8	430	13	8.0	>140,000
	1-10	(1962)		6.4	96.4	4	7.1	>1,400,000
	10-31	200 ft. below	4.1-	11.5	0.8	9	7.3	9,300
	1-10	(1962)		13.3	1.1	1	7.4	930

* Result on composite sample.

Table 3

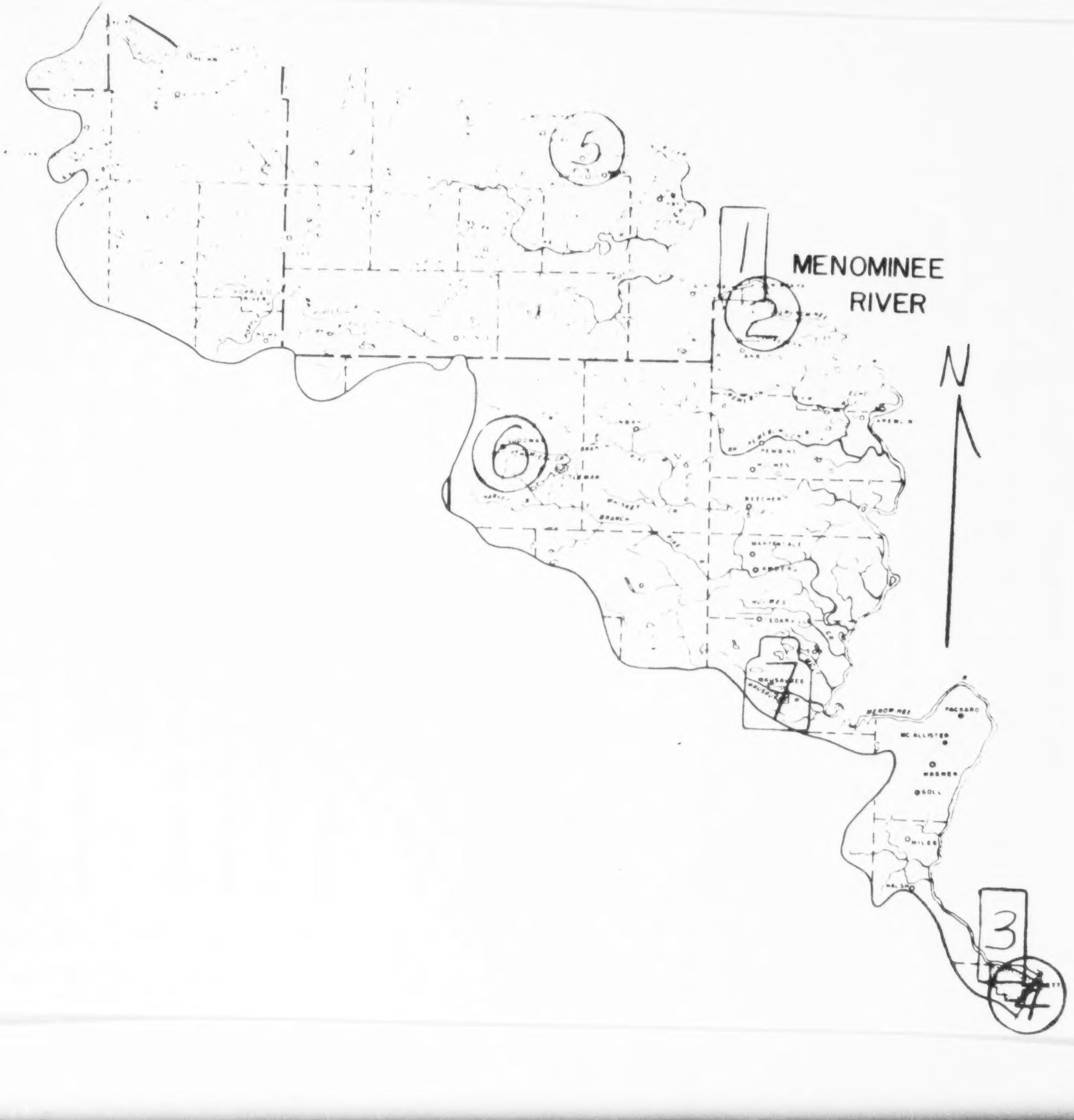
Cooperative Stream Survey Data - Menominee River

NIAGARA VICINITY

Mileage	Location	No. of Samples	Temp. Range °C	Max. B.O.D. mg/1	Max. D.O. mg/1	Min. D.O. mg/1
85.1+	Above mill	16	14-24	1.9	8.3	5.0
84.0	Below, off-shore	16	13-24	13.1	7.9	4.0
81.1	Highway 8 bridge	16	13-24	8.6	8.2	5.1

MARINETTE VICINITY

Mileage	Location	No. of Samples	Temp. Range °C	Max. B.O.D. mg/1	Max. D.O. mg/1	Min. D.O. mg/1
3.0	Upper dam	15	13-25	2.6	8.8	5.8
2.3	Lower dam	15	13-25	11.5	8.5	3.2
1.7	Highway 41	15	13-25	6.8	7.9	4.8


MENOMINEE
RIVER
N
1
2
3
4
5
6
7

DEFINITIONS

The Dissolved Oxygen (D.O.) in parts per million (p.p.m.) is a measure of the amount of oxygen dissolved in the water. A saturated solution of dissolved oxygen in water will contain about 14.0 p.p.m. at zero degrees Centigrade and about 8.5 p.p.m. at 25° C. Concentrations of less than 5.0 p.p.m. D.O. interfere with fish propagation and concentrations of less than 3.0 p.p.m. D.O. are considered critical for fish life.

The Biochemical Oxygen Demand (B.O.D.) is expressed in p.p.m. and is a measure of the amount of organic matter oxidized through biochemical processes In general, a high B.O.D. indicates presence of a large amount of organic material. It is normal to find a B.O.D. of from 2 to 3 p.p.m. in river waters receiving natural drainage.

The pH value indicates the concentration of hydrogen ions in the water and is used to determine whether a water is acid, neutral or alkaline. A pH of 7.0 indicates that the water is neutral. A pH lower than 7.0 indicates acidity and a pH higher than 7.0 indicates alkalinity.

The MPN indicates the density of coliform organisms. Since these organisms are of intestinal origin and are numerous in sewage, high indices are indicative of sewage pollution with its possible hazards to public health.

Suspended solids are solids mixed with and generally imparting a cloudy appearance to water, sewage, or other liquids.

Settleable solids are suspended solids which will settle in quiescent water or sewage in a reasonable period. Such period is commonly, though arbitrarily, taken as two hours.

Pollutional load is the quantity of pollution material discharged into a body of water. It is usually expressed in terms of pounds of biochemical oxygen demand per day, pounds of solids per day, or both.

Toxic wastes are wastes containing ingredients which cause mortality of fish or other aquatic life irrespective of the amount of dissolved oxygen present. Ammonia, acids, alkalies, cyanides, phenols and salts of the heavy metals are examples of toxic substances.

Biota is a term for all the living forms in a stream ranging from bacteria through microscopic plants and animals and insect larvae, to higher forms such as fish and rooted plants.

Plankton are microscopic drifting organisms found in natural waters. The plant forms are known as phytoplankton whereas the animal forms are called zooplankton.

Aerobic organisms are organisms which require free (elementary) oxygen for their growth. Anaerobic organisms will grow in the absence of free oxygen and derive oxygen by breaking down compounds containing oxygen combined with other substances.

Facultative organisms are organisms which can adapt themselves to growth in the presence, as well as in the absence, of dissolved oxygen.

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* * * * * *

MR. MUEGGE: May we have just a brief moment to confer with Michigan?

MR. STEIN: Surely, you may. We can recess, if you wish.

MR. MUEGGE: No.

I wish it to be noted that the States of Michigan and Wisconsin have had an interstate agreement with respect to joint pollution control in interstate waters for many years.

This resolution will be presented by the State of Michigan.

MR. STEIN: Thank you, Mr. Muegge. Do you want to go on with the presentation of the Wisconsin participants?

MR. MUEGGE: The City of Marinette, please. Would you come forward, please?

STATEMENT OF HONORABLE EDWARD A. WOLESKE,
MAYOR, CITY OF MARINETTE, WISCONSIN

MAYOR WOLESKE: I am Mayor Edward Woleske, City of Marinette.

We have a statement to present which the City Engineer has prepared.

I have listened to the conference so far. It seems that the City of Marinette is the bad boy in the situation. However, financially, we are moving as fast as we can. The orders have been issued by the State Board of Health, and very diligently the City of Marinette has been attempting to and has been conforming to these rules as set down. We have been separating our sewage systems as fast as economically possible.

In 1960, the city, in order to step up the rate of separation, proposed a system of presently collecting a sewer service charge in order to expedite and raise funds for this particular purpose. We presently derive $60,000 approximately from this source.

It is not a pleasant task to collect 70 percent of your water bill from your constituents. I can assure you of that. This money is earmarked specifically for sewage separation.

With the assistance of the Area Redevelopment Act and the Accelerated Public Works Program, we were fortunate and able, by Federal assistance, to procure, on a matching fund basis, additional funds. In one instance it was $65,000, and in the other instance it was $85,000. These funds were matched equally by the city, and in the past year we have done over $250,000 worth of sewer work in the City of Marinette.

We recognize we are not as pure and as clean as required. However, financially it is the best we can do.

Presently we have an application which we are sending forth to the Accelerated Public Works Program for an additional $150,000 to make further separation. If we can get the assistance of this board to give us the assistance in Washington for a matching fund, we certainly will welcome it.

We are not fighting this. We recognize this is a problem, and certainly we want to do our best. That is all I can say.

I feel exactly like possibly Daniel in the lion's den to come in here, knowing all the charges against the community. However, there is only just that much that we can afford, and we are doing our best.

Now, the City Engineer has a prepared statement which I think he will give you on the facts.

MR. STEIN: Thank you, Mayor.

Are there any questions?

(No response.)

MR. STEIN: By the way, Mayor, I would like to point out there is no one here who says you are bad boys, and I don't think anyone here who is in this business minimizes the problem of the separation of storm water and sanitary sewers.

This is one of the most vexing problems we have, and of interest might be some new legislation -- I don't know whether it is legislation which has passed the Senate, but in recognition of this situation, the Senate has proposed to provide $20 million a year for the next four years as a demonstration project to see if the communities can meet this question of separating storm water and sanitary sewage and finding some acceptable alternate way of disposing of it.

I think a fair reading of the legislation would indicate that one of the things against it, and what has made it a temporary thing for four years at $20 million a year, is the tremendous cost this would be over the country. Some of the cities, such as Chicago and Detroit and New York, have estimated that the cost of this would be billions of dollars to handle, and I think everyone recognizes the problem.

The question that I was asking, and maybe the engineer can cover this, was to have some kind of estimate as to the schedule of preparation and when the project will be done.

Again, I think this is the first question that comes up wherever you are, whether you are dealing with the newspapermen here or with the Congress or the Senators in Washington. When you talk about any city and say they have a gradual program for separation, they say, "What do you mean by 'gradual'?"

We are seeking this for an information point solely, not as a question of criticism, and you can be assured, at least from me -- and I will speak personally -- that recognizing the problem, I think the City of Marinette is to be commended in taking steps with meaning to them, because I know there are many cities in this country that have thrown up their hands and have not taken the first step towards separating storm water and sanitary sewage.

Rather than thinking you are bad boys, I think you have shown a remarkable amount of civic duty and civic pride in recognizing the problem and doing what you can to get at it.

MAYOR WOLESKE: Thank you. That is a better interpretation. We would like to get your help too.

MR. STEIN: Thank you.

MR. MUEGGE: Would you give your name and official position?

STATEMENT OF RONALD G. PEMBER, ACTING CITY ENGINEER, CITY OF MARINETTE, WISCONSIN

MR. PEMBER: My name is Ronald Pember. At present I am Acting City Engineer of Marinette. I am acting, because as of now I am not a registered engineer. I just graduated from the University of Wisconsin this year.

I would like to refer you to the following report given by Robert J. Foss, the former City Engineer of Marinette, at a public hearing on March 29, 1962.

His statement reads as follows:

> "After a hearing before the Water Pollution Commission here in Marinette on October 21, 1953, the Wisconsin Board of Health by its order No. 2-54J-15 dated April [illegible], 1954 directed the City of Marinette as follows:
>
> "1. To disinfect the sewage treatment plant effluent on a year-round basis instead of during the summer season as before.
>
> "2. To submit by January 1, 1956, a comprehensive plan for separating the storm water from the sanitary sewers together with a schedule for implementing the plan.

R. G. Pumber

"3. To report periodically on the sewer separation program and as may be requested by the Board of Health and Water Pollution Commission.

"I am happy to report substantial compliance with Order 2-54J-15. The equipment for the disinfecting the sewage plant effluent was installed in 1955 at a cost of $4,500. In addition to this, a grit chamber was installed at the sewage treatment plant in 1957 at a cost of $22,700 and in 1959 a new heat exchanger to heat the digester for proper operation was installed at a cost of $3,000 - and presently a new boiler to work in conjunction with the heat exchanger is being installed at a cost of approximately $2,000. Also our comminutor is being overhauled to improve the operation of pumps and equipment. It is readily seen that we have spared no expense in maintaining our sewage plant in top condition. We will continue this high level of maintenance in our treatment plant.

"Our sewer separation program has also been vigorously prosecuted -- and this activity will continue until the ultimate goal of complete separation is reached.

R. G. Pember

"In accordance with the Board of Health's direction, we inventoried the complete sewer system. We also designed the storm water system and submitted our report as directed in January 1956.

"Storm sewers -- I should say segments of sewers have been built as a part of every paving and street improvement since my coming to Marinette some 16 years ago. These isolated segments of storm sewers were connected to the combined system -- but are being separated as the trunk storm sewers are being extended.

"The first of such storm drains was built when Hall Avenue westerly of Park Street was surfaced in concrete back in 1951. A portion of this has been connected to one of the trunk sewers. The storm sewer program was accelerated in 1956 by connecting some previously laid sections and extending the storm sewers at a cost of some $40,000. Our program was continued in 1957 by laying 500 feet of storm sewers in some of the previously combined sewer area at a cost of $3,500 -- and in 1958 this work was continued -- laying 3,800 feet at a cost of $20,500. In 1959 --

"with the purchase of our asphalt plant -- and embarking on our extensive street program we laid some 4,200 lineal feet of storm sewer at a cost of $30,500. In 1960, we laid thw first segment -- 1,400 feet -- of our westside trunk sewer and 420 feet of the laterals at a cost of $33,000. We also laid a segment of new outfall and some 2,300 feet of sewer at another location at a cost of $24,000. In 1961 we extended the westside trunk sewer another 1,350 feet southerly from its terminus at Hannah Street and intercepted a section of the storm water laid in 1951 at a cost of $32,100."

Later in the report I will bring this up to date and discuss what was completed in the last two summers.

"There were several connections between our sanitary sewers and the storm water drains so that at times sanitary sewage spilled over into our storm sewers, and at other time the storm water was carried over into the sanitary sewer system. These connections were sealed as a part of our normal maintenance work -- and so the separation in these areas is now complete."

At this hearing, he had brought a map to show some of the work which had been done, which I don't have here today.

"The work of laying storm drains in the area shown in green will be undertaken as quickly as funds are available. Incidentally, I might add that the outer limits of the combined system lie along the southerly limit of the platted areas. Therefore with construction planned for this year and early next spring we will have a substantial portion of our system separated.

"In 1961, the City adopted an ordinance levying a sewer service charge. The amount charged is 70% of the water bill, and our anticipated annual revenues will be in the neighborhood of $75,000 to $90,000. Originally, the operation of the sewage treatment plant was charged to the sewer service funds; this has now been changed so that all revenues are applied to sewer maintenance and construction -- including of course -- storm sewers.

"One immediate effect of the instituting of a sewer service charge was to eliminate large volumes of clear water from the system. One industry was discharging 200,000 gallons daily of condenser cooling water from a private well into the sewer.

"The company has diverted the water into one of our drainage ditches. Several business houses replaced air-conditioners using clear city water for cooling with refrigeration type units, further lessening the volume of clear water entering the sewers.

"Equally important is the rebuilding of sewers laid in the late 1890's and early 1900's. We have had many major breaks in our sewer lines -- and have had to make major replacements. These repairs have been made using modern laying techniques and better materials -- particularly in the jointing, and we have thus eliminated large quantities of ground water from the sanitary sewer system. This is particularly significant when one realized that the local water table is about 4 feet below the ground surface. These major repairs have usually meant a complete relaying of the entire sewer main in the particular block. The amount spent on repairs since 1956 has averaged about $20,000 annually, varying from a low of $6,500 in 1957 to a high of $38,000 in 1959. This repair work is being continued whenever a break is found during the normal maintenance "operations. Our budget for this work is set at $29,200 for the current year.

"Our immediate plans in addition to those shown on the map"

-- which I don't have --

"call for relaying the outfall from our sewage treatment plant -- and eliminating the old slough which is filled with tar and causes considerable unsightliness particularly during warm weather.

"Next we will begin rehabilitation of the system in East Marinette. The present combined sewers will remain intact and be used as a storm drain; a new sanitary sewer system will be laid. The present plans call for the elimination of two older lift stations and replacing them with a single station; the new central lift station is already in operation. The existing large diameter sewers on flat grades will accommodate the storm water flows. The new sanitary mains will be smaller sized pipe laid on steeper grades."

One problem they have had in this area and one reason that we are very anxious to separate these sewers is that they were laid very shallow in order that the storm-waters would reach the Bay. This has given us many problems in the winter, and we will be glad when they are separated because this is a continuing problem.

> "Our sewer service charge revenues are being segregated to enable us to continue this sewer separation program. Along with this sewer work, is the need for repair and rebuilding the streets on which storm drains are laid. And because the street work must be done with current tax revenues, to further accelerate the sewer work would place an undue burden on the city's finances. The city has twice bonded for general improvements -- $164,500 in 1956 and $250,000 in 1960 to maintain the rate of progress on sewer separation. At the present time we have approximately $1,500,000 in bonded indebtedness -- and we anticipate very shortly the need for a new school at a cost of $120,000, a new bridge"

-- both of which have been built as we planned --

> "our share of the cost to be $300,000 -- and in prospect is a new municipal fire station. At present our general obligation debt service requires about $225,000 annually. To increase this debt service requirement by issuing bonds only for sewer extension would require a cut-back

"in the services rendered or a substantial tax increase. This we do not feel justified in doing. We could issue revenue bonds, pledging sewer service revenues to defray the cost. However, this is inadvisable because we would have to raise additional funds for street repair and replacement. Thus we would get less done with our sewer service dollar -- and the net effect would be to reduce the amount of storm sewer work done. We feel that our rate of progress in separating the storm water from the sanitary sewer system is adequate -- and consistent with good financial practice.

"The work of design and supervision of construction by contract is performed by our own city forces. The volume of work done in the past few years has required some outside help, though for the most part we have been able to accomplish both the planning and construction supervision with our own staff. This is ideal from the standpoint of the functioning of the department. We can easily handle a program of the size indicated.

"The City of Marinette is complying with the directives of the Board of Health and the

"Water Pollution Commission. We are making an honest, conscientious effort to eliminate the pollution in the Menominee River We feel the program is working well, and that the current rate of progress will continue, or may even be accelerated. We do not feel that there is enough to be gained from a crash program. We do believe that our present program is the best for the City of Marinette because it will not jeopardize our financing, nor will it be necessary to curtail any of the high level of services the City now renders its people. We do believe the local problem is being properly handled by local authorities and is achieving the best results."

That was submitted by the former City Engineer, Robert Poss, last year.

Now I would like to continue and state the progress that has been made during the summer of 1962, which we have in this report, and the past summer of 1963.

During the 1962 construction season, the following sewers were laid as a part of our sewer separation program:

Tenth Street Storm Sewer 2,060 feet	$9,430
Court House Lift Station	$4,680
Madison Street Storm Sewer 1,005 feet	$3,970
Catchbasins, leads, and manholes for above sewers	$10,000
Total construction 3,065 feet	$28,080

This year the City of Marinette was fortunate in getting Federal assistance through the ARA and APW programs which enabled the city to expand their sewer construction program. Two such projects were completed amounting to $174,957.12, which consisted of watermain, sanitary sewers and storm sewers. The west side trunk sewer was completed at a cost of $78,097.63. The remainder of the storm sewer was laid in the area of the industrial park and will serve as a trunk sewer for the southwestern part of the city. The cost of this storm sewer was $43,800. The remainder of the money was used to install sanitary sewers and watermains to serve the industrial park.

The following is a summary of all the projects completed or under construction at this time which are directly related to our sewer preparation program:

R. G. Pember

Riverside Storm Sewer 1,034 feet	$	14,460.00
Mary Street Storm Sewer		43,800.00
West Side Storm Sewer		78,097.63
Hosmer & Church Street Storm Sewer		11,930.00
Coleman Street Sanitary Sewer		7,950.00
Total	$	156,237.63

At the present time the City of Marinette is planning a sewer separation project in Eastern Marinette. This project will consist of constructing new sanitary sewers in Odgen Street and adjacent streets leaving the existing combined sewers as storm sewers. The details on this system have not been completed at the present time although the City Council has voted to make application to the Federal Government for an Accelerated Public Works Project amounting to $300,000, of which the city would be furnishing $150,000.

In summary, as of today, the city has spent $325,500 towards sewer separation. This is the cost of the sewers, not including the street replacements, and this is out of an estimated $889,000, which was the estimate of the engineer at the time of our report, 1955, to the State Health Department, which amounts to about 37 percent.

Providing that we do not get any Federal assistance, we would have available probably about $40 to $50,000 a year, which would mean another ten years from now to obtain complete separation of our sewers.

Are there any questions?

MR. STEIN: I think that answers the question.

I do have one question, though, and you might clarify this for the record, because it might look a little funny.

You are applying for an Accelerated Public Works Grant for how much? You said $300,000?

MR. PEMBER: Yes.

MR. STEIN: Of which you will put up $150,000?

MR. PEMBER: Right.

MR. STEIN: Now, if you could only go on your own then you could have $40,000 or $50,000. What happened to the other $100,000?

MR. PEMBER: In this case, the city would give priority to this project if we could get matching funds. I mean, it would be payable then. The city would have to take on the extra burden of repairing all these streets.

If we can't do this, it would be more practical on the city's side to progress on a pay-as-we-go basis.

MR. STEIN: That is understandable. This is the picture that I think the Congress and the people in

Washington get of these programs to help out.

I think the situation here, and I think we are getting a fair statement, is typical. The City of Marinette is faced with problems such as firehouses, schools, and other things, making a demand on their budget. I don't think it is any secret that throughout the country, sewage separation and sewage treatment generally turns out to be the low man on the totem pole, and that is why we may have a problem. However, I think that at least as far as I am concerned the efforts you are making for stormwater sewers seem to be entirely reasonable.

Now, let me read to you from our report -- and I hope you were here -- where they talked about your discharges every day.

They said that the mean coliform densities of the Lower Menominee River were increased to 8,500, slightly higher than the 5,000 level considered satisfactory for general recreational use. Effluent from the Marinette, Wisconsin, sewage plant is the principal source of bacterial pollution of the Lower Menominee River.

Now, if this is not the case, let us know; but if this is the case, I think it is so close to the goal that you should consider whether there is anything that can be done to improve that effluent, where we might be able to achieve this 5,000 level, or get below it.

MR. PEMBER: Well, I asked this question myself when I came to the city in June of this year, and the general opinion has been that the separation program would add more benefit than work on the treatment plant at this time.

The treatment plant would come after we had progressed further on our sewer separation program, so we wouldn't have to dump any stormwater in too.

MR. STEIN: Again, this may well be a valid judgment.

What kind of treatment do you have at the treatment plant now

MR. PEMBER: Primary treatment, two settling tanks, and to advance on our treatment would require putting in secondary treatment, which would probably run the city $150,000 or more.

MR. MUEGGE: You also have disinfection treatment.

MR. PEMBER: Yes. We disinfect prior to the settling tank.

MR. STEIN: What I am suggesting is that since you are so close to this level, it seems a shame -- I am not sure that this may have been done -- that a survey of operating methods may be able to tighten it up and may pull you over the line, because you are not dealing with big numbers or a vast reduction in order to get that.

Again, I just throw that out for consideration. It seems to me that if you are so close, there is no need for a sentence in any report which says that, "The Marinette, Wisconsin, sewage treatment plant is a principal source of pollution." I think possibly you can get that below.

Again, I would suggest that that might warrant another look at it.

MR. PEMBER: I have looked at it here in the short time I have been here, and I can't see where it can be, but possibly we can follow your suggestion and maybe we will be able to do something about it.

MR. STEIN: In the State of Wisconsin, of course, we might be able to return a couple of prodigal sons to them for a while, and they can help you.

Are there any other questions or comments?

MR. PIERCE: Yes. I feel compelled to make a couple of observations here.

One, it seems to me that the Chairman is belaboring a point needlessly on a couple of counts.

First, he keeps referring to a 5,000 limit, and it has not been established here -- and I predict that it will not be established here during this conference -- that this 5,000 limit is particularly meaningful. I think the inference here is entirely unnecessary and indicates only the opinion of the Chairman.

The other thing that is a bit irksome is a statement that he made, or at least I think he made, that usually pollution control facilities are at the bottom of the totem pole in municipal financing.

If he did say that, I think this is most unwarranted, because certainly in Michigan, and in the record that has been demonstrated here in Wisconsin, it is clearly shown that these municipal improvements are not at the bottom of the totem pole, but rather take a conspicuous place in the whole municipal financing program. Sometimes they are way ahead of many other things.

So I think that there are some overtones here that are a bit dangerous, and that I would challenge.

MR. STEIN: Well, thank you, Mr. Pierce.

I should say, No. 1, that I hold no brief for the 5,000. I am talking about a report that the technical people put out.

Secondly, I believe I said that nationally there was a tendency for this to be on the lower end of the totem pole. I think this has been the testimony of our Department and representatives of the Secretary's Office, the Public Health people, our construction grants people, before the Congress, and has been the testimony of representatives of national municipal organizations, such as the Association of American Mayors and the National Municipal Association.

I did not say this for your State. As a matter of fact, I think I pointed out that I thought Marinette was moving on stormwater sewers much more than we had found people in other areas of the country are moving.

MR. PIERCE: Very good. We accept your modification of that inference.

MR. STEIN: If it was a modification, you are welcome.

Mr. Muegge?

MR. MUEGGE: Is there any representative of the Village of Niagara here?

Would you give us your name and position and title, please?

STATEMENT OF JAMES HARVATH, TRUSTEE, VILLAGE OF NIAGARA, WISCONSIN

MR. HARVATH: My name is Jim Harvath. I am a Trustee for the Village of Niagara and I represent Mr. Waycovitch, who has another engagement.

I would like to refer to the report on the pollution of the interstate waters of the Menominee and Brule Rivers read yesterday, and a summary by Mr. West, on Page 29 -- I'm sorry, that is the wrong page.

MR. MUEGGE: Mr. West, could you give us the page number?

MR. WEST: I think he is referring to Page 2 of the original report. It came way at the end of the oral presentation.

MR. STEIN: Mr. West, why don't you go up there and consult with Mr. Harvath?

MR. HARVATH: No. What I am referring to is where it says in the report that the Village of Niagara is dumping storm sewage into the sanitary sewage. I am afraid that that is not right.

In the village, we do have a problem with spring water seeping into cracked sewer pipes, and the village this spring spent $5,000 on a T.V. survey, and in their budget meetings this fall allocated money to replace the sewers next spring.

It also says that at times the Village of Niagara doesn't treat all the sanitary pipes coming into the sewage disposal plant, and I have a report from the sewage disposal plant. The only time that we don't treat it is when there is an extended power shortage, and it has to be over three hours. We haven't had any for ten years.

That is about all I have to say, Mr. Chairman.

MR. MC DERMOTT: May I ask a question?

MR. STEIN: Yes.

MR. MC DERMOTT: On your T.V. survey to which you have referred, did you find infiltration in only one sewer?

MR. HARVATH: One sewer about 400 feet long.

MR. MC DERMOTT: That was the only one?

MR. HARVATH: That's right.

MR. STEIN: And that is going to be corrected this spring, you say?

MR. HARVATH: Well, the primary budget meeting was set up.

MR. STEIN: I mean, it is scheduled to be corrected this spring, if all goes well?

MR. HARVATH: That's right.

MR. STEIN: While we can do this, if we may, just to get the record clear --

MR. WISNIEWSKI: It will be in the next construction year. You are not going to do anything this winter. It gets cold up here.

MR. HARVATH: In the spring.

MR. STEIN: In the spring. We recognize that, but before you go, just to get this squared away, you have no objection to that statement, do you, Mr. West?

MR. WEST: No, sir.

MR. STEIN: Thank you.

MR. MUEGGE: Are there any other questions?

(No response.)

MR. MUEGGE: I would like to call Mr. George White, Town Chairman of the Town of Florence.

Is he present?

(No response.)

MR. MUEGGE: Are there any municipalities that wish to make a report?

(No response.)

MR. MUEGGE: I am going to call upon Mr. Billings of the Kimberly-Clark Corporation for a statement.

STATEMENT OF RICHARD BILLINGS, ASSISTANT TO THE VICE PRESIDENT OF RESEARCH AND DEVELOPMENT OF KIMBERLY-CLARK CORPORATION

MR. BILLINGS: Mr. Stein, conferees and ladies and gentlemen:

My name is Richard Billings. I am Assistant to the Vice President of Research and Development of Kimberly-Clark Corporation. I received my degree in Chemical Engineering from the University of Minnesota in 1937 and since that time have served in various technical capacities throughout the corporation. During the last 18 years I have been very active in the field of water and waste treatment and have coordinated the corporation programs for pollution abatement and stream improvement at the various mills. During this entire period I have observed the activities of the State regulatory authorities and worked with them in carrying out the various orders which they have issued. Because of these facts, I am very familiar with the Kimberly-Clark mill at Niagara, Wisconsin, and that portion of the Menominee River with which the mill is concerned. I am also familiar with the steps that have been already taken at this mill to improve river conditions, those steps that are currently in progress and the long-range plans for maintaining a healthy, working stream.

When the subject of papermaking is brought up, one thinks of two things -- wood and water. The papermaker to be sure of his own future must safeguard the future of both of these. The Menominee River represents the past, present and future of the Niagara mill. Without it, Kimberly-Clark would not have located there originally; without it, we could not be operating today; without it, there would be no plans or security for the future for its 900 employees who spend its present 5 million dollar annual payroll. In spending this 5 million dollars, they provide for the health, education and welfare of not only themselves and their families, but for all of those other people with whom they do business throughout a substantial area of Wisconsin and Michigan.

It is only natural then that we in Kimberly-Clark should know well this portion of the Menominee -- this natural resource vital to our very existence. We have studied its flows -- from flood to drought stage. We have witnessed the effect of the dams installed to reduce its flow variations. For large portions of the year we run chemical tests both above and below the mill to determine the effect of the mill discharge upon the river. These sampling tests are performed at points established with the advice of State regulatory agencies. In addition to this, we do regular testing downstream for a distance of 15 to 20 miles -- well beyond the low point of the oxygen sag curve that results from the river's assimilation of the discharge from the Niagara mill. We make regular boat trips down the Menominee and have located the sludge banks in the stream. We have staked out the major banks so that we know something about their size. We take the river's temperature. We know about the slime growth on the stones of San Portage Falls, for example, and about those areas where slime exists on the river bottom just as we know about those areas where it does not exist. So I repeat, we are very familiar with this portion of the river.

The question naturally follows then: "If Kimberly-Clark knows the conditions of the river so well and is doing something about it, why does the Department of Health Education, and Welfare find it to be still polluted?"

The answer is simply this: The word "pollution" covers a wide range of things from those that are just a little bad to those that are very bad indeed. Let me illustrate:

A certain stream may be called "polluted" because a plant manufacturing cake coloring discharges some

R. Billings

harmless dye into it and the water is colored pink for a short distance. As contrasted to this, individuals everywhere were shocked and angered by the recent "pollution" of the Mississippi River in which thousands of ducks and other wildfowl were destroyed. Both instances are types of pollution. The one might offend someone's esthetic sense; the other was a disaster. The words "to pollute," therefore, are quite different than the words "to behead." You are either beheaded or you aren't. You can't be a little bit beheaded. It's very easy, on the other hand, to be a little bit polluted.

The term, pollution, therefore, is meaningless unless stated in terms of reference to some alternative. What is the alternative to the degree of pollution existing at any one time? What is it worth to the general welfare of the area to correct the existing degree of pollution? In the above case, removing a harmless color from the water would be worth something, but would it justify putting a plant out of business?

Obviously, when Kimberly-Clark built the mill at Niagara back in 1898, disposal and stream conditions were not considered as problems or even as potential problems. Newsprint made from wood pulp was a new idea. There was no technology then. As the years went by, the area expanded and the mill increased its production to meet the increasing demands for its products by the growing population. Total industrial waste discharge at first increased as production increased, but when pollution loomed as a problem, Kimberly-Clark took steps to reduce that waste discharge and has been reducing it ever since. A woodroom screening system has been installed to eliminate bark and chip discharge to the river. All contamination from mill sanitary sewage was eliminated several years ago. We have instituted controlled discharge of our spent sulfite liquor to avoid temporary overloads of the river. We have set up a soil disposal system to maintain the oxygen content of the river by reducing the load from the mill during low river flow periods. This system, incidentally, can add as much as $5.56 a ton or several hundred dollars a day to the cost of sulfite pulp manufactured at Niagara. This method is extremely effective, however. Even in this driest of years, there have been no fish killed and not even a sign of fish distress in the area under consideration. And there are plenty of fish there -- walleyes, pike, perch and crappies have been caught there all summer. The crappies have gone as high as two and a half pounds in weight -- and that's quite a crappie.

I will not bore you with the details of steps that have been taken in the mill or to list the equipment changes and additions that have made this progress possible. Wisconsin's Committee on Water Pollution has all this information. I think this progress can best be illustrated by the actual figures for biochemical oxygen demand being discharged to the stream during the 15-day period of the Department of Health, Education, and Welfare survey in August of 1963 as compared with the average discharge figures of as recently as six or seven years ago.

In the year 1956, for example -- and I took 1956, because 1955, 1956 and 1957 were all about the same, so I took the middle one -- total biochemical oxygen demand discharged from the mill averaged 83,895 pounds per day. The test period of last summer averaged 50,800 pounds per day, a reduction of 40 percent. We feel that a decrease of 40 percent over a six-year period during which time the total production of the mill actually increased is something to be proud of.

This brings up a most serious objection. This is the objection to the use in any report of the term "population equivalent" in referring to industrial wastes.

Mr. West hoses down this view in his summary statement. He shouldn't hose it down. He chews it out completely.

R. Billings

The Niagara mill does not have an organic pollutional load equivalent to the waste discharged by 304,800 people as stated in the report. It is true that 50,800 pounds per day of oxygen will be required to stabilize this volume of wastes whether they come from our mill or from a municipality, but here the similarity ends.

The "population equivalent" of the sulfite pulp mill in terms of feces and urine is zero.

The "population equivalent" in terms of typhoid germs or infectious hepatitis is zero.

The "population equivalent" in terms of B-coli or other bacteria that grow in human digestive tracts is zero.

Therefore, to single out the lone point of similarity and say that it has the same "population Equivalent" because it requires the same amount of oxygen is as though you were to say that a single meat packing plant takes as many lives in a single day as the Nazis did in wiping out the City of Lidice. Such comparisons can only mislead those who read them -- and I readily grant that my comparison is reaching too.

Here is a comparison. I hope the audience can see this. This is a form of sugar.

This is diacetone mannose, a compound prepared from wood sugars, which was isolated from spent sulfite liquor. This weighs approximately 7/10ths of a pound and has a biochemical oxygen demand of one pound.

Now we are told -- and the figure is accepted everywhere -- that the daily waste from six people, sanitary waste, would total one pound of biochemical oxygen demand to satisfy it.

I refuse to agree that this is equivalent to the daily discharge from any six of the Green Bay Packers.

(Laughter.)

Table 2 of the Health, Education, and Welfare report gives "population equivalent" for the Niagara mill and says in a footnote that it is based on data supplied by Kimberly-Clark. What was actually done was that the basic data supplied by Kimberly-Clark was multiplied by six and reported as "population equivalent." I have divided by six and put it back in terms of pounds of oxygen demand the way it was originally and the way it should stay to have any meaning.

But to return to the extent that Kimberly-Clark has tightened up operations and reduced wastes to the Menominee River. Just this summer a system was worked out to reduce groundwood rejects, and wastes from this source have been reduced by an average of one ton per day. A new coating recovery system has likewise been put in operation and while it is still too early to give precise figures, the results to date indicate a further reduction of coating discharge to the tune of a ton to a ton and a half per day. These may seem like rather small increments in themselves, but improvements from here on will have to be in small increments. It is the same as being on the football field where the going gets very tough down inside the 10-yard line. And as compared with where we were a few years back, we are now definitely inside the 10-yard line. It differs from the football field, however, in that the goal line keeps moving as the nature of our economy and social structure and density of population moves. The 20-yard line of today was the goal line of yesterday.

Mr. Mackenthun, Mr. West and others have done a very creditable job in preparing their report, especially when limited as they were by time requirements and deadlines. The report as it pertains to industrial wastes in the Upper Menominee River is in general agreement with conclusions reached by the State of Wisconsin and with the facts as established by the extensive testing of Kimberly-Clark technical people. It is correct to say that most of the industrial waste and oxygen demand which is currently being assimilated by the Upper Menominee River comes from the

Kimberly-Clark mill at Niagara. There are numerous sludge deposits in the 15-mile stretch of the river below the mill and growths of sphaerotilus or slime occur on the stones and logs on the river bottom. These growths, while harmless, are unsightly and detract from the esthetic beauty of the immediate stretches involved. Improvement in the appearance of these stretches is recommended to enhance their recreational potential. We agree that further improvements are necessary, and as mentioned above, they are already in progress. In addition, as a result of the most recent hearing on the Menominee River, the State of Wisconsin in February 1963 -- just this year -- ordered Kimberly-Clark to submit plans and a program for further stream improvement for review and approval by the State on or before July 1, 1964. We hope it to be before.

The Department of Health, Education, and Welfare report makes pointed reference to the sludge banks in the river. The report fails to mention, however, that the major contributing factors to the sludge beds were the woodroom wastes that were discharged to the river a number of years ago before the addition of more modern refinements. A complete screening system for bark and other woodroom losses was installed in September, 1955, and losses of bark or chips can occur now only when a mechanical breakdown occurs.

Such accidents are being made increasingly less likely to happen as dry mechanical barking of a portion of the logs was started in 1961. Future plans call for a gradual reduction in wet barked wood to the point where we hope to eliminate wet barking entirely in prior to eight years.

Another very important fact not mentioned in the report is that the sludge banks have decreased in size over the past years and are much smaller today than they were ten years ago. This, of course, is a point that could not be determined in any one spot-check of existing conditions, but we in Kimberly-Clark know it because we have been checking the river sludge banks for the past ten years.

We feel that the report by the Department of Health, Education, and Welfare has omitted certain very important points in their discussion of the relationship between dissolved oxygen and fishlife. We also question the flat statement that "for sustained propagation of a normal, healthy, warm water game fish population, fresh water rivers and lakes should contain at least 5.0 mg/1 of dissolved oxygen." Also we question the statement that it is "generally agreed that the dissolved oxygen concentration should not be reduced below a minimum of 3.0 mg/1 at any time." We believe that what it should say is that it would be "nice" if 5 mg/1 of dissolved oxygen were to be present at all times, just as it would be "nice" if there could be 6 or 8 mg/1 dissolved oxygen present at all times.

I use "nice" in this respect. We who live in Wisconsin and Michigan were very uncomfortable last summer due to the high temperatures, and we were very uncomfortable last winter due to the freezing temperatures, and if it were going to be as hot as last summer or as cold as last winter all the time, we probably would not be living here.

But we know this. However, we do think it would be nice if the temperature could always be maintained between 68 and 78 degrees.

This, however, is not necessary. Also, it is not "generally agreed" that dissolved oxygen concentration should not be reduced below 3.0 mg/1 at any time. For example, Tarzwell of the Department of Health, Education, and Welfare's Taft Sanitary Engineering Center in Cincinnati wants 5 mg/1 with a minimum of three. Scott and Moss at the University of Georgia, on the other hand, demonstrated that bluegills survived at as low a concentration as 0.6 mg/1 of dissolved oxygen, providing the change to this level was gradual.

Because of the wide discrepancy and lack of general agreement, Dr. Willis Van Horn, Biologist of the Institute of Paper Chemistry in Appleton, reviewed available technical studies on the subject and in September 1961 reported the findings of some 34 different investigators -- investigators, incidentally, who included young fish or fingerlings in their studies -- not only adult fish. He concludes in his summary that as a result of this review, it would seem that a well rounded, warm water aquatic population can be maintained at dissolved oxygen levels of 3 to 5 mg/1. Note that he says a well rounded, warm water aquatic population" -- not that 3 mg/1 is the minimum.

The State of Wisconsin refers to concentrations of dissolved oxygen of less than 3 mg/1 as being critical to fish life. The term "critical," however, must have various degrees of meaning. When the true dissolved oxygen level falls between 1 and 2 mg/1, the situation may be termed "critical" as the fish, while not in distress, may be uncomfortable. When the true dissolved oxygen content falls to zero, the condition is "critical" because the fish are dead. Obviously, the word "critical" does not mean the same thing in both cases.

There is another point which may seem technically minor in nature, but is of practical importance in the actual measurement of dissolved oxygen. Note that in my previous statement I emphasized the "true dissolved oxygen content." It has been found only recently that the presence of spent sulfite liquor in river water depresses the dissolved oxygen test results, causing them to be fictitiously low. Investigators stumbled onto this fact when they observed that fish were continuing to live in water containing spent sulfite liquor when the test for dissolved oxygen content indicated that there was absolutely none there whatsoever. For fish to continue to exist in the complete absence of oxygen would, of course, be impossible. The only conclusion to be drawn, then, is that oxygen was present, but that the test was not showing it. The amount by which the test results are lowered by the presence of spent sulfite liquor has as yet not been determined. It is assumed that it must vary with the concentration and it is also assumed that the actual oxygen content may be as much as .5 mg/l higher than test values would indicate. This would seem to be a logical assumption since no investigators report the survival of fish at less than .5 mg/l dissolved oxygen; so if fish were still alive and active, this amount of oxygen must have been present even when the test showed none at all. At Niagara we use the observed test value for our control purposes. Whatever this difference amounts to, therefore, is very definitely in our favor.

One further point to be made -- and it is a very important point -- is that the species of fish living in the Menominee River do not spawn during the late summer and fall. They spawn at that time of year when temperatures are low (and the dissolved oxygen is correspondingly higher) At the time that walleyes spawn, for example, the dissolved oxygen content is well in excess of 6 mg/1. In July and August, when due to low flow and higher temperatures oxygen content of the river is the lowest, the Niagara mill maintains a satisfactory dissolved oxygen level by hauling spent sulfite liquor to the mill's land spray disposal area. There soil bacteria perform the same function that harmless water bacteria do in breaking down and digesting the spent liquor. This system and its operation were described in detail at the hearing held by the State of Wisconsin in March 1962. During July and August the river will average between 2.5 and 3 mg/1, and we maintain a minimum of 2. This is well above the survival level for all species of fish present and it leaves a margin in case of accident, and we had such an accident this summer. We were very glad we had this margin.

I always say it is not as important where you are at the moment as it is where you have been and where you are going.

This stretch of the river described in this report which, according to the report, averages 2.6 parts per million dissolved oxygen, used to fall down to zero parts per million dissolved oxygen at certain times and in certain periods of low flow.

The relative merits of one investigator's opinion and technique versus those of another can be long debated. However, proof of the pudding is in the eating. We have been using this method of control since 1957 and it has given entirely satisfactory results. Game fish live, propagate and are being caught in the 15-mile stretch of the Menominee River below the Kimberly-Clark mill, and I can prove it. Our program for maintaining oxygen levels received its toughest test this summer when average August river flows were among the lowest on record. A system which will work under the extreme conditions of 1963 should work anytime.

This leads us to a second point of disagreement with the Department of Health, Education, and Welfare report. The impression given by the report is that the river flows of the August test period, averaging 1,187 cubic feet per second, were not unusual and could be expected to happen statistically almost every year. This is not the case. There is a danger in using statistical averages and statistical tables of data without supplementing these first with complete firsthand information. The data used in the Health, Education, and Welfare report was taken from the very comprehensive volume "Drought Flow of Michigan Streams." Information for those data was collected over a 41-year period, 1914 to 1954, inclusive. In 1941, however, the Wisconsin-Michigan Power Company completed the dam creating the Michigamme Reservoir and put this equalizing reservoir into operation. This so altered the variability of the flow of the Menominee at Niagara that data collected before 1941 cannot be used to calculate or predict the flows since 1941 without adjustments being made that are admittedly only guesses. August 1963 was not a normal August. Records maintained by the Wisconsin-Michigan Power Company of flows from Big Quinnesec Dam just upstream from the Niagara mill show that there was only one August since the construction of the Michigamme Reservoir in 1941 when river flows were significantly lower than in 1963, and only one other August when flows were even down to this year's low range of 1,100 and 1,200 cubic feet per second. In addition, flow data without temperature data can be meaningless from the standpoint of a river's capacity to clean up its own waters. The higher the temperature, the lower the dissolved oxygen content, and the lower the dissolved oxygen content, the slower the rate of cleanup. August is the most critical month of the year as water temperatures in the Menominee are usually at their maximum then. Any person living in the area, however, would not need statistical data to tell him that 1963 has been an unusually dry year.

I call the above items to your attention only as illustrations of the unavoidable errors which always occur whenever anyone attempts to apply overall generalities to specific situations.

At the start of this report, I discussed briefly progress made during the past few years in improving the Menominee River. Now, what about Kimberly-Clark's plans for the future?

These are numerous. Foremost is the fact that Kimberly-Clark research has made a breakthrough in the pulping field and developed a new pulping process. The pulp from this process will be a substitute for sulfite pulp in Kimberly-Clark in numerous, but not all, instances. The sulfite mill at Niagara will be shut down and dismantled.

Here I would like to depart a moment from my prepared statement, because I wish to set the record straight on one point.

The calling of this conference had absolutely no effect on the plans for Kimberly-Clark for the future of the Menominee River. It did not alter them in any way.

R. Billings

These plans have been underway for many months. The State Committee on Water Pollution was informed of this before the announcement went out to the press.

The first question that was asked me by Mr. Wisniewski was, "What will happen to the sulfite pulp mill? Is this an additional load?"

I told him, "No. The sulfite pulp mill will be shut down and partially cannibalized to produce a new mill."

He asked me, of course, what was going to be the total effect up there. At that time we were not about to say exactly how much the effect will be. I told him that we couldn't, but that we would supply him information as soon as this was available, and this information went out to him about a month and a half ago, as far as we had brought it along.

Present plans are to construct the first unit for the new pulping process at Niagara. In getting ready for this, we have made bioassays of the new effluents and found them to be without toxicity. This new process will produce less waste per ton of pulp cooked. I am not prepared to specify how much less at this time, but the difference will be significant, and of practical importance.

But I will say this: That during the spawning season we will average 5 parts per million on the Menominee

River and never fall below 4.

This they know. This has been passed on to the State.

We are unable at the present time to tell what we will be able to do during the low-flow period, because the reaction under higher temperatures, as you well know, is quite different. We do not know what the rate of reaction will be.

How successful we are in our efforts to improve the dissolved oxygen minimum will be dependent upon the success of our soil filtration system, which is now being used in our present sulfite mill. To determine this, of course, because the effluents are different, will require months of study. We already have tests in operation in the research and development, and we must do the work all over again as we have done it on pulp sulfite effluent, because this is a new effluent.

I repeat: Even though we cannot put a figure on exactly how much it will be at this time, it will be significant and of practical importance.

With less wood sugar to thrive upon, there will be less slime growth in the river. Slime will not be completely eliminated, however. As long as there is a pulp mill at Niagara, there will be some sphaerotilus growing in the river.

The new process will require less water per ton of pulp and a new mill always gives opportunities for further reducing the discharge of suspended solids. The previously mentioned move to eventually abandon the old wet barking process will eliminate the possibility of screen breaks or other accidental discharges to the river. To these moves must be added the many in-plant changes, some of which are already in progress. Any one of the above would be a substantial advance. Taken all together, they draw an extremely encouraging picture of the stream improvement prospects for the Upper Menominee.

In conclusion, we in Kimberly-Clark are most interested in the purpose of this conference. We do not see how the present industrial discharge from the Niagara mill can be endangering the health or welfare of anyone. The economic welfare of everyone in the area, on the other hand, could be jeopardized by the imposition of arbitrary standards at arbitrary times. Such arbitrary standards could make pulp manufacture too expensive to continue at Niagara and block the future of the mill.

Kimberly-Clark knows that the subject of industrial waste control cannot be dismissed by the statement that it is a matter of having either jobs or clean streams. Today we can have and we must have both. But it must be remembered too, that there cannot be 1863's streams in 1963's economy. A hundred years ago the population along the Menominee River was a few hundred people. Today, two counties alone bordering the river have 60,000 people.

Kimberly-Clark cannot have stream improvement as its only goal. It must maintain wages for its employees, earnings to pay those who lend it their savings, quality and cost advantages for its customers, and research and new equipment for its future existence. All of these goals require dollars -- dollars which come out of the same pocket. No goal can be slighted -- no goal can be emphasized to the detriment of another. I repeat, therefore, we in Kimberly-Clark are much interested in the purpose of this conference.

I would summarize by saying that we in Kimberly-Clark are well aware of the problems of industrial waste disposal and of their continuing nature. We have made definite progress in the last ten years. We have made progress in 1963. Our plans for the future include continuing progress since we know that tomorrow will be more demanding than today.

The State has been looking over our shoulder for ten years watching to see that we practice what we preach.

We don't mind this pressure -- we don't object to it at all -- because we know that we do practice what we preach. I think that our record on the Menominee and elsewhere is conclusive evidence that we have tried and are trying and that our efforts have been and are being successful.

Thank you very much.

MR. STEIN: Thank you.

Are there any questions or comments?

MR. MC DERMOTT: Mr. Stein?

MR. STEIN: Yes.

MR. MC DERMOTT: Mr. Billings, I gather you have been able to forecast the D. O. that will be found in the Menominee River when your new plant goes into operation -- your new process.

I think you mentioned a figure of what -- 4 to 5 milligrams per liter?

MR. BILLINGS: During the spawning season only.

MR. MC DERMOTT: During the winter months?

MR. BILLINGS: No. During the spawning season.

MR. MC DERMOTT: The spawning season only?

MR. BILLINGS: That is until the bass season opens.

MR. MC DERMOTT: Now, you are able to make that forecast for that season, but you indicated that you were unable to make such a forecast for the warmer months.

Why? Why are you unable to make that type of forecast for the warmer months? I am asking this as a lawyer.

MR. BILLINGS: Well, that is a very logical question.

The reason for it is that the rate of reaction, the instantaneous oxygen demand as compared with the five-day or the ultimate oxygen demand, varies with the temperature, and we have observed some rather unusual things when we begin to get into temperatures that we experience during the summer months. Therefore, we can make our statement about the spring based upon what we know our new plant will do, but our present control methods are based upon hauling to our spray disposal area and the disposal through this sand and gravel.

Now, we do not know that our new waste will respond the same way or can be used for this treatment without splitting up the soil, and the only way we can find that out is to reestablish, as I said, this whole test period.

We have had people from the Institute of Paper Chemistry -- I will change that. That is an error. We have had people from the Sulfite Pulp Manufacturers over, and they have worked with us in a description of how they set up the original tests. We have set them up again.

We have soil columns, and we are in the process of determining this, but this will take several months.

That is why I was unable to give Mr. Wisniewski a statement on the summertime as to what we could do, until I have that information.

MR. MC DERMOTT: In other words, you won't have that information, I gather, until some time early in 1964?

MR. BILLINGS: That's right. When I have it, Mr. Wisniewski will have it.

MR. MC DERMOTT: Thank you.

MR. STEIN: Are there any other questions or comments?

(No response.)

MR. STEIN: Well, that was an excellent presentation, Mr. Billings.

I will say I have heard Mr. Billings many times before, before Congressional committees and other places. He always does make an excellent presentation, and our experience, at any rate, has been that Kimberly-Clark is a progressive company.

I think we can agree that they have made more than reasonable efforts to try to meet the problems in pollution control, and I think the differences that Mr. Billings may have with our scientific people are the kind of differences, if they are really differences, that you always run into in the scientific community.

I think many of his points are well taken. There is one point I think we should clear up, though, at least in the Health, Education, and Welfare report, and this was one of the points which interested me that Mr. Billings did not touch on.

In our summary of the Upper Menominee River, it says:

> "Solids pollution, including wood chips and fibers,"

-- and we will leave the bacterial slimes, and so forth, out, but largely wood chips and fibers degrade the river for recreational purposes, and particularly, as our biologists point out, coat the bottom and interfere with fish food and possibly fish propagation.

As I understood your statement, Mr. Billings, you had indicated that the wood fibers were no longer a problem from the Kimberly-Clark plant?

MR. BILLINGS: I said that the wood chips and woodroom wastes should not be problems.

If you were disturbed by that point, I was plenty disturbed, and so was everyone else, when we read the statement about the wood chips, because they cannot get away now unless we have some sort of an accident, unless there is a plug-up somewhere and they may be washed out in drains, or something.

In the old days, this bark and everything was taken off in the wet barking process and came to the stream, and I think, as Mr. Mackenthun points out in his statement, that barks and chips when they get into the river will move and lie for rather prolonged periods at the bottom before they disintegrate.

MR. STEIN: Then let's see if we can get the picture.

If, as Mr. Mackenthun points out, there were wood chips and wood fibers in the stream interfering with, in his opinion, the propagation of fish life and fish food in the stream, I take it that your view is that these wood chips and wood fibers were in there because of old types of operations, and that accretions are not made to them except by accident.

The question here is, what can we do to get rid of them, or do you just wait for the time, or is it a point that any paper mill has to do any more than they have already done?

MR. BILLINGS: Well, now I must correct you, because you added certain words to that.

MR. STEIN: Yes.

MR. BILLINGS: We still have a loss, as any paper mill does, of wood fibers, when you get down to fibers that make this (indicating).

These are not thrown away, as you carelessly throw away a candy bar or something like that. These are fibers that get away in spite of us, in spite of the best that we can do, and there is some. That is why I have pointed out some of the things that have been done.

Incidentally, Mr. West, at the time of your survey, this groundwood reject that I was talking about, we had gotten about half of the reduction that I have mentioned in here. I pointed out to you in a letter that this was a real reduction and we expected it to be more. It has increased, and it is now up to a ton a day.

This whole process from here on is not a question of doing any one great, big thing; it is a matter of tightening up of a great many smaller things, and we are moving in that direction, and continually moving with our in-plant changes, which are the ones that I mentioned in here.

MR. STEIN: Yes, but here let me again raise this, because this is what the biologists asked me to do. They said be sure and cover this wood chip and wood fiber business.

Can we say, or can you say what the effect of the new plant would be on wood chips or wood fibers?

By the way, let me go back. If you shut down the mill, how long will the mill not be operating at Menominee?

MR. BILLINGS: Well, there will be no pulp mill. The paper mill will continue to operate, of course, but there will be no pulp mill for a period of several months.

MR. STEIN: On the condition of that river, would you say that there would be a discharge of chips and fibers which would continue to create problems to fish life from the mill?

MR. BILLINGS: Can we kill those chips right away?

MR. STEIN: Yes. I would like to.

MR. BILLINGS: No, no. They should not be included now. In fact, we are not losing wood chips at the present time.

The fact that he found some there -- they were either the ones that had been there for a long time, or they were some that might have been washed off down the drain at some time, and we don't know how they got away.

But let's talk about fibers.

MR. STEIN: Fine.

MR. BILLINGS: There will be some fibers, of course. We will continue to discharge the fibers. We can't clear it up absolutely air-tight.

I was a little surprised at Mr. Mackenthun's statement yesterday that he did not remember an improvement in the bottom condition.

I think that if you will read the transcript of the hearing held in March 1962, you will find that there were certain areas of this 20-mile stretch which had been improved between the hearings on the river, some of them by as much as two grades.

The sludge beds of the river, which, as I reported before, we have staked out and we know considerably about, are smaller in area and less than half in depth what they were when we started. They are going down.

MR. STEIN: Let me ask a specific question: Do you think with your new pulp mill you will be losing less fibers than you are now?

MR. BILLINGS: Oh, yes.

MR. STEIN: Considerably less?

MR. BILLINGS: Yes.

MR. STEIN: Could it be more?

MR. BILLINGS: This is not a regular pulp mill, you see. It is entirely different.

MR. STEIN: Well, you know what your in-plant housekeeping might be.

MR. BILLINGS: Oh, yes.

MR. STEIN: Would you, in your opinion, think that these fibers will constitute a hazard to fish life? Let us assume this for this assumption: Now, I know you have come to a possible disagreement with the Department of Health, Education, and Welfare report, but I think that the Wisconsin report agrees with the Department of Health, Education, and Welfare report on this point on industrial waste, in their statement. I am reading from Pages D-2 and D-3.

> "The Niagara mill of Kimberly-Clark Corporation is acknowledged to be the largest source of pollutional material discharged to the Menominee River. In spite of the high reareation capacity of the river below Niagara slime growths are evident for some distance below the mill and the prevalence of tolerant bottom organisms results in categorizing that section of stream as polluted from the biological standpoint."

Without asking you to agree with that, or our statement -- and I think that both the Department of Health, Education, and Welfare, and the Wisconsin statements are remarkably similar in this area -- assuming that they consider it pollution, would you consider that the fibers which are going to be put out from your pulp installation will not materially contribute to some things which both these reports consider to be pollution?

MR. BILLINGS: That was a very long statement.

MR. STEIN: Yes.

(Laughter)

MR. MC DERMOTT: Do you want the reporter to read it back?

MR. STEIN: I will rephrase it.

Would you think that your discharge of fiber from the new mill will be contributing to pollution?

MR. BILLINGS: Do you mean a little polluted or plastered now?

MR. STEIN: You draw your own term.

MR. BILLINGS: If one fiber goes into the river, it is polluted by that term, whatever you are using for pollution.

What I am questioning is, if you are saying are we going to do a little polluting, I would say yes.

MR. STEIN: Is that going to interfere with fish life and aquatic life significantly, or substantially?

MR. BILLINGS: I do not see how the fiber from the new mill can interfere substantially with the fish life on the Upper Menominee.

MR. STEIN: I am very interested in your statements about a little pollution. They are really pregnant statements, aren't they?

MR. BILLINGS: I couldn't use that term, Mr. Stein.

(Laughter.)

MR. STEIN: Now, may I ask you a general question on this roadbinder situation?

Would you care to comment on that, on what the figures mean in the report, particularly the Wisconsin report, on the use of your carting away of materials for roadbinding and the prognosis of this use?

I just saw the figures and I don't know that the conclusions are very apparent, or what they mean, or what the direction that we are going in is.

MR. BILLINGS: Well, maybe I should tell you as to what our situation is up there.

We do not make any charge for the roadbinders. We need roadbinder trucks, and roadbinder is distributed on as many roads as we can get it onto in the area.

Because of the fact that the area is not too heavily settled, even with these 60,000 people living in the two counties, there is a very definitely limited market for the roadbinders. When I say "market" I mean if you talk about giving something away as being a market.

We therefore have to supplement this by the hauling to the spray area, and we do not know what this will be as regards roadbinders, this new effluent.

So you see we are in the same fix there as we are with our soil filtration. Until we do find out, we can't make any statement, but at least everything that we will find out will be in a favorable direction.

MR. STEIN: All right. Let me see if I can make a statement on this and see if this is a fair statement.

1. You don't know whether your new effluent will be suited for roadbinding.

2. As indicated from these figures, there really isn't a steady market that you can predict, since this is created by someone else, for roadbinders, from year to year.

MR. BILLINGS: Well, that is incorrect. If I gave you that impression, I am wrong.

MR. STEIN: All right.

MR. BILLINGS: There is a big demand in the area for the roadbinders, but it is not as large as it is, for example, down in our Kimberly-Clark area, because there just aren't as many roads, but there is a steady demand.

One of the ironworks companies uses a great deal, and that is a steady demand, but there just isn't the overall demand. That is one of the reasons that the decision was made in cutting down the sulfite pulp mill, because the process was too old to be modified -- the old equipment. Most of the equipment could not be renewed and we felt that we had gone just about as far as we could in a reduction of pollution of the river. We know what the standards are of the river, and so we are trying to go to this new method, which we hope will reduce the use of this other method and completely eliminate it.

MR. STEIN: Maybe you are not the man to ask this one last question on roadbinders. You may not want to answer it, Mr. Billings, but some of the reports that I have read state that putting this liquor on as roadbinder is just stretching out the process, since eventually it washes off the roads and gets into the stream anyway.

MR. BILLINGS: No. That is absolutely incorrect. We have only had one instance in the last ten years where there was a problem of it washing out of the road and creating an oxygen demand, and that happened in Milwaukee, where the day after or the very night of an application there came a heavy rain, which took it all into a little tiny stream that goes right along there.

However, after the roadbinder has been on the road for, oh, 24 to 48 hours, it seems to solidify in there. It binds the properties of the gravel materials together, and it has an unusual effect, that while it is soluble, only parts of it are soluble -- portions of it are soluble -- because in areas where we have had to dig up roads where the roadbinder has been used for long periods of time, we have had some objections from the counties to the effect that they wore out their blades so quickly. In other places where we have had to cut through an area that had been used with roadbinders, we have had to use air hammers to break the material up.

It makes a very, very solid base, and it reduces the amount of gravel and maintenance that has to be done on any country road.

MR. STEIN: Do you want to ask a question?

MR. MC DERMOTT: Yes.

Mr. Billings, I have one or more questions.

I gather you are optimistic -- I think you have used that word -- about this new process that will go in at Niagara.

What I want to know is this, however: You have indicated that possibly the effluent that will result from this new process, that you won't be able to use that as roadbinder. That is a possibility, I gather, and there is also a possibility, I gather, that this same effluent won't be disposable under your present system of your spray.

MR. BILLINGS: Yes.

MR. MC DERMOTT: All right. Now, let's say that both those possibilities, from a pessimistic viewpoint, worked out to be actualities, and that you could not dispose of this new effluent in either way, as roadbinder or in your spray irrigation program, what then? Haven't you a worse problem, if I can put it that way? Let's strike that.

Haven't you had a very severe and substantial problem then, and how would you cope with it if those two things happened?

MR. BILLINGS: No, because even if neither of these systems worked out, the situation on the Menominee River will be very much improved by the very nature of the process.

I refuse, as a technical man, to express hope at a high level, and therefore I am not giving any figures on this, but even this in itself -- we know enough about it now to know that this will improve the river even during the low periods. However, we are not prepared to say how much until we do some more work, because of the factors that I mentioned to Mr. Stein -- the rate of oxygen demand which at the higher temperature occurs during the summertime.

MR. MC DERMOTT: And that is even if you can't use this effluent for roadbinder and if you can't dispose of it on the land?

MR. BILLINGS: That's right. We would not gamble on having anything work out.

MR. MC DERMOTT: All right. One further question. I may be getting into the business secret area, and you may not want to answer this way.

I believe you said you had a payroll of $5 million per annum, roughly?

MR. BILLINGS: Roughly.

MR. MC DERMOTT: And 900 employees?

MR. BILLINGS: Right.

MR. MC DERMOTT: Do you think that this new process, when it goes into operation, is going to result in an increase in the number of those employees and an increase in the payroll, or is this something you wouldn't care to answer?

MR. BILLINGS: Yes. Because of the fact of the way you asked it, it is going to result in a decrease in the number of employees at first.

MR. MC DERMOTT: You mean initially?

MR. BILLINGS: Initially.

MR. MC DERMOTT: All right.

MR. BILLINGS: I am now talking about the period when the one mill is shut down and the other one starts up, because we are reducing our summer hiring program. We have tried to time this thing so that we can tide many of the people over, but the new mill will employ less people. One of the reasons that the new mill is going in there -- not the old mill -- but one of the reasons it is going in there is because of the pollution situation on the Menominee River.

MR. MC DERMOTT: You hope that in time you will get back to the 900 level of employees?

MR. BILLINGS: Oh, yes.

MR. MC DERMOTT: You will in time?

MR. BILLINGS: Yes.

MR. MC DERMOTT: Is there a possibility you will exceed that?

MR. BILLINGS: Yes. If this works out, there is a possibility we will exceed that, but we do not have any plans on that right at the moment.

MR. MC DERMOTT: All right. Thank you.

MR. STEIN: Mr. Billings, you have raised some other points. I would like to make some comments. If you want to re-comment on this, that is fine.

We have covered about 1,000 plants in the proceedings such as we have here, and in subsequent stages sometimes.

We have never, to my knowledge -- and we have pretty carefully documented that -- put a plant out of business because of strong anti-pollution measures. This is not our intention. This is certainly not the point, as I hope you well know, with Kimberly-Clark. I don't think there is any reason for concern, particularly with a firm as progressive as Kimberly-Clark.

I would like to bring up a couple of points.

MR. BILLINGS: Mr. Stein, may I comment on that particular statement there?

MR. STEIN: Yes.

MR. BILLINGS: I don't know if you are a hunter or not, but if your companion, while you are hunting, insists on carrying his 12-gauge shotgun pointed at your head, even though you have never seen him kill anybody — you have never heard of him shooting anybody -- even if the companion happened to be your own wife and keeps telling you all the time how much she loves you, you are going to be unhappy.

(Applause.)

MR. STEIN: Evidently they like that analogy, but I do believe they will really bring you mother's milk and not a shotgun. You might want to change your glasses.

By the way, you had another analogy there about the hot weather and the temperature. You know, that always reminds me of Mark Twain. We do a lot of talking here and a lot of talking about temperature. Of course, no one can change the temperature, but we believe, as you have indicated, that you can improve the quality of the stream.

MR. BILLINGS: And we have improved it.

MR. STEIN: That's right.

Now, we have just a few more points. The other one is on this population equivalent. This is not a phrase which has been developed by the lawyers or the administrators This is a term that has come up to us from the technical people, and I don't want to point a finger, but it comes from the technical people. Evidently it is taught to them in engineering schools.

I think we all know when we deal with pulp mill wastes or sugar beet wastes, that we are not talking about a disease-carrying operation; but again we have, or I have no brief for that. I do think when the technical people use it -- and they can communicate in any way they wish -- I understand what they mean. I think you understand what they mean.

I think the difficulty here is that you think this might give a wrong impression to the lay public. Years ago in the Public Health Service I used to work in vital statistics and I always wanted to call the body "the remains" and the coffin a "casket," an undertaker a "funeral director," and so on and so forth, so I appreciate this.

However, I would suggest that you are directing your remarks in a sense to us to the wrong forum. If you go to the technical group and get them to change their terminology, I am sure everyone will be delighted to accept it.

MR. BILLINGS: Mr. Stein, I appreciate that you didn't start this particular thing. I would like to know who the culprit is who did, because it was none of the technical group that I have ever had any connection with.

It was never mentioned in school in my engineering days, and that was a number of years ago, so that whoever developed this certainly did it without, to my knowledge, a complete technical understanding of the problem. I would certainly recommend that we bury it once and for all and not waste your time and our time talking about a comparison that can only be misleading.

MR. STEIN: Mr. Muegge?

MR. MUEGGE: I think the term originated with the intention of showing industrially what the effect would be from an oxygen-consuming standpoint on the streams.

I think, when you are dealing with industrial wastes all alone, there isn't any question that in trying to indicate the relative importance of it from an oxygen-consuming standpoint, that we should all use tons, because that is what we are going to use in calculating the stream requirements to meet the law.

MR. STEIN: Go ahead, Mr. Wisniewski.

MR. WISNIEWSKI: I might point out that Mr. Billings is far ahead of what the Department of Health, Education, and Welfare and the State of Wisconsin are.

We have been using the term for about ten years, and I have corresponded with technical men in the Health, Education, and Welfare group asking them to use the term "pounds."

They have disregarded it, primarily because the term "population equivalent" is a bigger number.

I might also call attention to another fact which may have been missed. The waste from the pulp mill is called sulfite liquor. You notice in our report we call it sulfite liquor. This is a utilizable product in many of our mills, and we don't call it "wastes."

MR. STEIN: Thank you, Mr. Wisniewski.

For the record, I don't think you should get into this controversy here. I think our technical people have possibly different views of the reasons for using that.

However, to get to another point, I would like your comment on this: You said that the slimes were harmless As far as I can judge from other areas of the country where we have had complaints from fishermen, where these get on the boat and the nets and their lines, they did not consider them harmless.

Again, I would here like your comment on that.

MR. BILLINGS: I think "unsuitable" or "undesirable" would be better than "not harmless."

I live on the shores of Lake Winnebago. Lake Winnebago is a very shallow and a very large lake, and it has a very good fish population.

When I go fishing on that lake, which I like to do regularly, I very seldom can drop my line in any place and bring it up without having to clean the line off because of the natural growth in there. I will agree with you that it is undesirable but I would not single out this case as saying that because this happens we are contributing to it. The fish is there. They will go there.

MR. STEIN: All right. Now, again this comes back to the weather question. I think we learn to live with things we can do without.

When a fisherman has to strip stuff off his line -- and the indication is that this is there because of a discharge upstream -- he only has the notion that maybe they can do something with the discharge upstream to prevent it. If this came as an act of God or was there naturally, I think most fishermen -- they are not like the hunters -- are mature enough to accept it.

I just have one last comment. As I understand the new proposal, you will have an average of five parts of dissolved oxygen, and a minimum of four during the spawning season?

MR. BILLINGS: Right.

MR. STEIN: This will, as I understand it, be satisfactory for the propagation of the fish indigenous to the Menominee River Basin?

MR. BILLINGS: So I understand.

MR. STEIN: That is what my understanding is. I don't want to have any view, but during the rest of the year— and this is understandable with this process and being conservative and being a technical man -- you just can't say at this time what the minimums will be?

MR. BILLINGS: Mr. Wisniewski had asked me exactly that same question and almost in the same words.

I cannot say, for the simple reason that I just don't know yet.

MR. STEIN: Again, let's see if I understand the situation.

As I understand it -- and I have checked this before I came out with Mr. Warren, who, I believe, used to work in Wisconsin, the minimum dissolved oxygen requirement in Wisconsin is three. If I am wrong, correct it.

Now, presumably any discharge from any mill, Kimberly-Clark or any other mill, would have to meet the Wisconsin minimum requirements throughout the year. Is that correct?

MR. MUEGGE: Should I answer that?

MR. STEIN: Yes.

MR. MUEGGE: That is a goal that we are seeking to attain. It does not mean that we expect to do it overnight.

MR. STEIN: No. Let's see if I can check this, because we have been in many States down south where they now have minimums of four.

As I understood this, the information that I have was that your goal was five. That was the optimum, but you required a minimum of three.

If we are incorrect, I think we should have the record straight.

MR. WISNIEWSKI: The provision is this, Mr. Stein: The minimum is three, and if you can maintain a minimum of three with low stream flows and high temperatures, then you will be assured of five or above during your spawning season, because of the increases in flows, and the lower temperatures in spawning season.

MR. STEIN: I thoroughly agree with that, and I think, as is the case with technical people perhaps, for administrative ease it is always best to check on the minimum. It is very much easier to check on that than an average, and if you can maintain the minimum of three, particularly during the low flow, the likelihood is that you are going to have much higher dissolved oxygen rates at other periods of the year. I think the whole concept of using a minimum is good. But again, as I understand it, this is your requirement that someone maintain a minimum of three?

MR. WISNIEWSKI: That is what we strive for.

MR. STEIN: This is not a regulation or requirement?

MR. WISNIEWSKI: There is no regulation or standard of that type by the State.

We are required under our laws to require three within economical and practical limits, and sometimes you can't get up to the three parts per million.

MR. MUEGGE: It may be better put that that is an objective.

We have a study group which is using that term presently, as is the Health, Education, and Welfare and Public Health Service organization, so I think it might be applicable anywhere that that is an objective rather than a standard.

MR. STEIN: Mr. Muegge, let me make a remark on that.

One, I don't accept the assumption that it is our organization, just for the sake of the argument here. I think that the reason that the term "objective" is used there is because the organization, however constituted, is not authorized to put out standards, and has no enforcing law or regulatory effect. This is the old argument on objectives or standards.

Generally speaking, I think our biologists have indicated to us that when you were using a stream for fish propagation and recreation based on fish, that a minimum of three parts per million of dissolved oxygen was required.

Now, I know Mr. Billings has had some other information, but you could get it down much lower if you wean the fish and do it gradually. This doesn't happen in streams very often.

I think in many other fields, in milk sanitation, of which Wisconsin can be really justly proud, you do have safety factors; and I think our people and the people in a good many of the States -- the administrative officials -- believe that three is a minimum or should be a requirement.

MR. MC DERMOTT: Mr. Stein, could I ask you a question about that? The lawyers in the audience know, and perhaps all the non-lawyers know as well, that an administrative rule or regulation promulgated by a State agency -- I know in Wisconsin -- has the full force and effect of law.

I suspect that that is equally true of Michigan, and it may well be true throughout the whole United States on a State level.

Now, am I to understand that it is the position or opinion of the Secretary of Health, Education, and Welfare that it would be well for States or the interstate agencies, the State water pollution control agencies, throughout the States, that have rule-making power, to adopt a rule or a regulation, if you want to call it that, that would prescribe in absolute terms a minimum D. O. of three parts per million, without any latitude in the matter -- that this would be an absolute requirement, and, conceivably, that there will be a violation of law if this requirement were not met? Is this the position of the Secretary?

MR. STEIN: This certainly is not the position of the Secretary. Let me tell you, it is much broader than that.

As far as I understand, the Secretary of Health, Education, and Welfare, has never indicated how a State should run its program, or whether it should have regulations or not on a State-wide or river basin basis, or whether it should deal with situations on a case-by-case basis. That is up to the State.

What I am suggesting, though, Mr. McDermott, is dealing with a factual situation and dealing with, under our statute, something that endangers health or welfare. I don't think that your report, the Wisconsin report, differs in the effect, certainly from a biological point of view.

I think most of the scientists will agree that below a certain level we have a deleterious effect when, in dealing with the factual situation, we come up with a particular number that we have to deal with.

Now, I don't know that the Menominee River has been demonstrated to be peculiar in this respect, or different than any other river.

MR. MC DERMOTT: May I ask, your biologists with

Health, Education, and Welfare -- is it their opinion that this type of rule that I have mentioned prescribing a minimum D. O. of three parts per million should be adopted? Is this the opinion of the biologists?

MR. STEIN: I can't speak for the biologists.

One thing I can say is they have never sent this up to us for general promulgation. I don't know that Mr. Mackenthun can speak for all the biologists. He is free to speak for himself. He has sent this up.

I should point out that in the statute or the present bill being considered by the Congress -- and again I don't want to footnote this too much -- this was not a suggestion of our Department or the Administration.

There is a proposal that we give the States a reasonable opportunity to set standards on interstate waters, or portions thereof, and if that isn't done within a reasonable time, we do it ourselves; or if the standards do not meet the purpose of the Act, which presumably is to prevent endangering the health or welfare, we adopt these standards.

Now, I think this is such a fundamental operation that unless this were worked out by statute and Congress wanted it, I am sure, Mr. McDermott, that officially our Department would not propose this.

MR. MC DERMOTT: One further question. Could you tell me, Mr. Stein, if you know, the names of any States -- any State or States that have a rule prescribing a minimum D. O. of three?

MR. STEIN: We had a case recently on the Escambia River between Alabama and Florida.

By the way, both of these cases are situations involving paper mills. Florida demanded that the water be four parts per million.

In the Coosa River between Georgia and Alabama, the receiving State asked -- it is always the State other than that in which the paper mill is -- that the water contain four parts per million.

I think if you go out to the Pacific Northwest, not in the coastal streams but in the type of stream we are dealing with here, you will find Washington and Oregon have been having similar requirements.

Now, again, this may be due to local situations. Before Mr. Wisniewski answers, the people down south tell us, because of the heat in the water, the heated conditions and the sluggish conditions of the stream, that it is harder to maintain the four parts down there than it is up here.

MR. WISNIEWSKI: I just want to point out, Mr. Stein, when you talk about the State of Washington, you are talking about rivers with a 50,000 cubic feet per second minimum flow.

MR. STEIN: Yes, I agree with that. I said the conditions might be different.

MR. MUEGGE: May Mr. Billings be excused?

MR. STEIN: Yes.

MR. MUEGGE: I would like to ask Mr. Stein one question, just as a matter of information.

Since the Public Health Service did not promulgate the proposal to include standards in the water pollution law minimums, who did?

MR. STEIN: Do you want this on the record or off the record?

MR. MUEGGE: I don't care where it is.

MR. STEIN: I don't think it is appropriate for the record. I will be glad to talk to you about it. However, I don't think it is appropriate for the record.

MR. MUEGGE: A lot of other stuff is on the record that wasn't appropriate either.

MR. STEIN: I don't think there is any secret about this.

Off the record.

(Discussion off the record.)

MR. STEIN: Do you have time to call someone else before twelve?

MR. MUEGGE: We would like to call Mr. Dughie.

STATEMENT OF D. J. DUGHIE, GENERAL MANAGER OF WISCONSIN MILLS OF THE SCOTT PAPER COMPANY

MR. DUGHIE: My name is D. J. Dughie and I am general manager of Wisconsin mills of Scott Paper Company. I reside in Marinette, Wisconsin.

Our Marinette plant furnishes extremely stable employment for about 22% of Marinette's industrial working force. Our payroll and our pulpwood purchases make an important economic contribution to the entire area on both sides of the Menominee River. We try our best to be good neighbors, and we think that we are.

We have been active in the control of water pollution ever since Scott has owned mills in Marinette and in Menominee. We have installed a great deal of new equipment for the sole purpose of cutting our discharge of fiber and other organic materials.

Studies and hearings to assemble data and recommend, review, and approve successive steps for improving surface waters have been conducted by the Committee on Water Pollution of the State of Wisconsin since 1953, with constructive results. Most recently, following a hearing held in March 1962, the Committee on Water Pollution, State of Wisconsin, issued an order to Scott Paper Company requiring it to file plans by July 1, 1964, for additional reduction of discharges of wastes from its Marinette sulfite pulp mill. The company is planning for compliance with this order. In all of these programs, Scott Paper Company has participated conscientiously and sincerely. It will continue to do so, to the continuing benefit of both Michigan and Wisconsin.

Our plant records show that more than 50 pollution control projects were separately engineered and effectively carried to conclusion since 1952. Our total outlays in the past eleven years for pollution control installations and related technical control and research at our Marinette and Menominee plants have exceeded one-half million dollars.

Here are a few examples of what we have done in our Marinette plant. We have installed:

1) Filter-type savealls for each of our four paper machines to cover fiber that formerly went to the river.

2) A system for re-using process water in the pulp mill to cut fiber discharge to the river.

3) Systems for recirculating more of our process

water in the paper mill for the same purpose.

4) A system to collect and meter the discharge of spent sulfite liquor to the river at a rate at which the river can assimilate it.

5) Woodroom modifications to reduce discharge of bark and chips to the stream, plus a screenings recovery system.

Also, we have increased our use of peeled pulpwood, thereby reducing the volume of bark to be screened. During 1963, about 95 percent of the sulfite mill's wood will come peeled.

We have made comparable improvements at our groundwood pulp mill across the river on the Michigan side.

At no time, even in years of low flow and warm water temperature, has the dissolved oxygen in the river below our mill been insufficient to support aquatic life, nor has it fallen below the high levels required by the Wisconsin authorities.

Our water wheels and the turbulence created by our spillways actually put dissolved oxygen into the river. Our regular chemical analysis of the river shows periods when downstream water contains more oxygen than upstream.

Even during 1963, when river flow and temperature have been the worst in at least 15 years, the lowest dissolved oxygen reading found in our periodic analysis was 4.8 parts per million, and this on only one occasion.

To keep close track of river conditions, our mill employs a full-time technician. He continuously checks all fluids in process and in the mill sewers, and his findings have pointed the way to many constructive improvements.

In the field of pollution abatement, Scott Paper Company is a long-time member of the Sulphite Pulp Manufacturers' Research League, whose sole function is to seek new and ever better methods to enable sulfite pulp mills to reduce their discharge of spent sulfite liquor into mill streams.

In conclusion, it is our sincere purpose to restore all used waters discharged from our mill to the stream to as satisfactory condition as may be reasonably necessary and economically supportable.

Thank you.

MR. STEIN: Thank you.

Are there any comments or questions?

(No response.)

MR. STEIN: I just have one, I hope.

The Lower Menominee River, our report says, is degraded for a distance of three miles below the Scott Paper Company at Marinette, Wisconsin, to its mouth, by wood chips and fibers, slime bacteria, and elimination of bottom organisms.

Then it says that the Scott Pulp and Paper Mills at Marinette, Wisconsin, and Menominee, Michigan, are the principal sources of pollution.

Now, do I understand that with this pre-peeled bark, the conditions referred to here will be eliminated?

MR. DUGHIE: I don't think it will make a substantial change, Mr. Stein.

We haven't been discharging large quantities of bark for many years. We have gradually increased the amount of peeled wood, I would say, from around the late 1940's to the present time, from zero to the 95 percent that I speak of

I must qualify myself as not being a technical man. Apparently, we are talking about degrees of pollution. I notice the report said "degraded." It didn't say "polluted." Apparently, this I interpret as a minor degree.

We have had a lot of talk about dissolved oxygen, and apparently this is the final manifestation of pollution, and, as I pointed out, our tests show -- and these are cooperative tests with the Wisconsin authorities -- that we do have five parts per million below our lower dam.

MR. STEIN: I am not talking about that.

Again, just for clarification, where they talk about elimination of bottom organisms, I think, if our report is correct, we do have a problem that we should address ourselves to. I wonder if this exists, that you have eliminated the bottom organisms on the Lower Menominee River for a distance of three miles below your company, and whether this shouldn't be something you should be giving attention to?

MR. DUGHIE: Again I say I am not a technical man. I don't think I know the complete significance of these figures.

I would like to suggest one thing that has been brought up here, that earlier Mr. Billings referred to the age of many of the beds found in the bottom of his part of the river.

I would like to remind the conference that before the paper mills were ever here and during the early years of the paper mills, that history tells me that there were literally dozens of sawmills right along the banks of the river that we are speaking of. This may or may not have had some effect on the present condition of the bottom of the river.

MR. STEIN: Again, I am not a technical man, but as far as I know from our technical people, we don't know the answer to that.

I would suggest a question for discussion when we come back might be if your mill were to go into the river how, absent anything else, and with a natural riverbed, will your operations result in the covering of that riverbed so that it would eliminate bottom organisms?

MR. DUGHIE: That is a very hypothetical question.

MR. STEIN: I don't know that it is hypothetical or if it is a residue from time past.

The question here is, if this is something that is staying around so long, no matter what you did, even if you closed down there wouldn't be any bottom organisms unless someone came out and dredged it or cleaned it some other way.

I don't know what the answer is. I am just raising the question. Our report seems to indicate that the Scott Paper Company might consider doing a little more at its mills because of what it says.

MR. DUGHIE: I have noticed the report.

MR. STEIN: Yes. Thank you.

Are there any further comments or questions?

(No response.)

MR. STEIN: May we recess for lunch? We will reconvene at two.

(Whereupon the conference was recessed until 2:00 p.m. of the same day.)

AFTERNOON SESSION

2:05 p.m.

MR. STEIN: May we reconvene?

At this point, again we would like to call on the State of Wisconsin.

MR. MUEGGE: I would like to call Mr. Ruth for a statement.

Would you give us your name and the organization you represent, please?

STATEMENT OF WILLIAM RUTH, PRESIDENT, THE WISCONSIN FEDERATION OF CONSERVATION CLUBS

MR. RUTH: I am William Ruth, President of the Wisconsin Federation of Conservation Clubs, and I represent them here.

The Wisconsin Federation of Conservation Clubs is a State-wide organization of affiliated Conservation Clubs with an estimated membership of over 60,000 individuals

We are the Wisconsin affiliate of the National Wildlife Federation.

We consider the prevention of water pollution as one of the most serious problems facing us today and we are greatly concerned about the conditions that exist not only in Wisconsin, but over most of the United States.

It seems that in spite of some improvement in our inadequate pollution control laws, that we have still lost ground in our efforts to have clean water. We hope this is not the case, but it seems to us that it is, and 1963 seems to bear this out.

We refer to three so-called accidents in 1963 that happened here in the Midwest: The oil spills in Minnesota last winter; the spill of acid in Oconto, Wisconsin, a short time ago that ruined paint on houses and autos and what happened to the river is easy to guess. Then a few days ago 40 miles of the Embarrass River in Illinois became a real "river of death" by being polluted with cyanide. Luckily the death of five cows alerted officials to the conditions before any people were involved. None of these accidents should have happened.

Those who take the easy and cheap way out by continuous use of our streams as open sewers often contend that there isn't enough money to clean up pollution. For the wealthiest and most productive nation with the highest technical knowledge in the world to say that it costs too much to protect the health and welfare of its people is simply unthinkable.

Modern industry and municipalities have the responsibility to their neighbors and communities not to contaminate our waters.

The Menominee and its tributaries, the Brule, Paint, Michigamme, Pine, Popple and others, were all clear, clean water streams of high potential recreational value. No part of them should be contaminated.

We wish to urge the United States Public Health Service and the Pollution Control Departments of Michigan and Wisconsin to take whatever action they deem necessary to clean up the sources of pollution in the Menominee River.

Thank you.

MR. STEIN: Thank you, Mr. Ruth.

Are there any comments or questions?

MR. OEMING: No questions.

MR. STEIN: Any here?

(No response.)

MR. STEIN: Thank you very much for your statement

MR. MUEGGE: I think we will terminate with that.

We might, at some future time, wish to call one other individual.

MR. STEIN: Certainly, Mr. Muegge.

Thank you very much for a very complete statement on the part of Wisconsin. Now, if we may call on Michigan, who will do the honors?

MR. OEMING: I guess I am elected.

MR. STEIN: Mr. Oeming.

STATEMENT OF LORING F. OEMING, EXECUTIVE SECRETARY, MICHIGAN WATER RESOURCES COMMISSION

MR. OEMING: Mr. Chairman, fellow conferees, ladies and gentlemen:

The presentation by Michigan will be in two main parts. We have a number of statements from individuals, from industries and groups, that we have been advised are to be presented as a result of inquiry and a letter addressed to about 75 organizations, municipalities, industries, and various governmental groups, that went out under dates of October 7th and 8th, advising them of the conference and opening the way for them, if they wished to, to make statements at this time.

I have received perhaps five or six of these statements, which we will present through calling upon the people, if they are here, that wish to present them.

The other portion of our presentation is contained in a report on water pollution control in the Michigan portion of the Menominee River Basin.

Mr. Purdy, I believe, has distributed to the conferees official copies of this report, and our presentation will be in the form of a resumé, where it is possible, and reading portions of the report, where necessary. This will be done by a series of persons who will discuss various sections of the report.

This report contains information on the municipal sewage and industrial waste disposal situation in the Michigan portion of the interstate waters of the Menominee and Brule Rivers and their Michigan tributaries. It delineates the accomplishments that have been made in controlling pollution and the measures that are being taken to provide improved control. It also describes the uses being made of these waters and water quality conditions.

The report was prepared for presentation to the conferees at the Federal conference called by the Secretary of Health, Education, and Welfare for their consideration and appraisal in (1) arriving at conclusions as to whether waste discharges originating from Michigan sources are endangering the health or welfare of persons in a State other than that in which the discharge or discharges originate; (2) the adequacy of measures that have been taken for abatement of pollution; and (3) determining the nature of delays, if any, being encountered in abating pollution.

The area encompassed by the report includes all of the Michigan portion of the Menominee River Basin.

At this point I would like to call attention of the conferees and those in attendance to the map which was prepared by the Michigan Water Resources Commission staff entitled "Water Uses in The Michigan Portion of The Menominee River Basin, 1963," which is on the easel at the front of the room.

This map shows the drainage basin in Michigan of the Menominee and Brule Rivers. It has a legend which shows the treatment provided by the various governmental units -- that is, the degree of treatment, whether there is treatment or whether there is no treatment, or no public sewers, or sewers with no treatment.

It also shows the industrial waste sources, the location of hydroelectric plants, parks, public access sites to the rivers, the river basin boundary, and the location of water intakes.

MR. STEIN: Pardon me, Mr. Oeming. Do you want this map in the record, or is there a picture of it we can reproduce?

MR. OEMING: I will offer it, sir, in the record. It is reproduced in the report in black and white.

MR. STEIN: We will reproduce that with your report, if that is satisfactory.

MR. OEMING: Yes.

MR. STEIN: Thank you.

MR. OEMING: This is for illustrative purposes here, rather than referring to the report.

MR. STEIN: I see. Thank you.

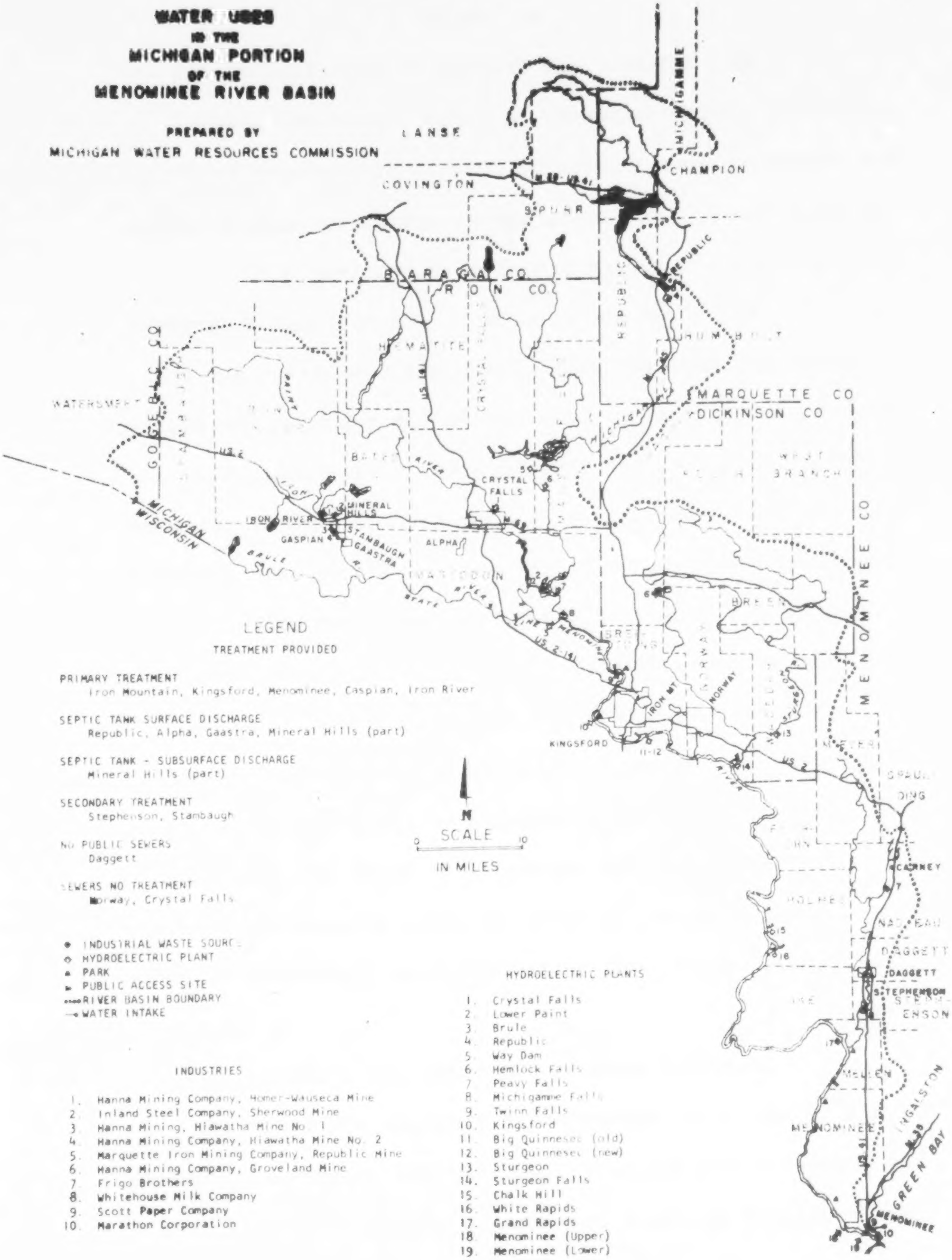
MR. OEMING: The industries are listed on the lower portion of the map. There are ten industries and their locations are keyed in on the drainage basin chart, and the hydroelectric plants are also located and keyed in by number and name on the chart.

As I just stated, this chart is reproduced in the body of the report, which we are presenting to the conferees.

(The map referred to is as follows:)

WATER USES IN THE MICHIGAN PORTION OF THE MENOMINEE RIVER BASIN

PREPARED BY
MICHIGAN WATER RESOURCES COMMISSION


L'ANSE
COVINGTON
SPURR
MICHIGAMME
CHAMPION
REPUBLIC
BARAGA CO
IRON CO
HEMATITE
CRYSTAL FALLS
HUMBOLDT
MARQUETTE CO
DICKINSON CO
WEST BRANCH
WATERSMEET
GOGEBIC CO
US 2
US 141
M 69
M 95
MICHIGAN
WISCONSIN
IRON RIVER
MINERAL HILLS
CASPIAN
STAMBAUGH
GAASTRA
ALPHA
MASTODON
BRULE
PAINT
BATES
IRON MT
KINGSFORD
NORWAY
STURGEON
MENOMINEE CO
SPALDING
CARNEY
NADEAU
DAGGETT
STEPHENSON
MELLEN
INGALLSTON
MENOMINEE
GREEN BAY
M 35
US 41
N
SCALE
0
10
IN MILES

LEGEND

TREATMENT PROVIDED

PRIMARY TREATMENT
Iron Mountain, Kingsford, Menominee, Caspian, Iron River

SEPTIC TANK SURFACE DISCHARGE
Republic, Alpha, Gaastra, Mineral Hills (part)

SEPTIC TANK - SUBSURFACE DISCHARGE
Mineral Hills (part)

SECONDARY TREATMENT
Stephenson, Stambaugh

NO PUBLIC SEWERS
Daggett

SEWERS NO TREATMENT
Norway, Crystal Falls

● INDUSTRIAL WASTE SOURCE
○ HYDROELECTRIC PLANT
▲ PARK
► PUBLIC ACCESS SITE
•••• RIVER BASIN BOUNDARY
→ WATER INTAKE

INDUSTRIES

1. Hanna Mining Company, Homer-Wauseca Mine
2. Inland Steel Company, Sherwood Mine
3. Hanna Mining, Hiawatha Mine No. 1
4. Hanna Mining Company, Hiawatha Mine No. 2
5. Marquette Iron Mining Company, Republic Mine
6. Hanna Mining Company, Groveland Mine
7. Frigo Brothers
8. Whitehouse Milk Company
9. Scott Paper Company
10. Marathon Corporation

HYDROELECTRIC PLANTS

1. Crystal Falls
2. Lower Paint
3. Brule
4. Republic
5. Way Dam
6. Hemlock Falls
7. Peavy Falls
8. Michigamme Falls
9. Twinn Falls
10. Kingsford
11. Big Quinnesec (old)
12. Big Quinnesec (new)
13. Sturgeon
14. Sturgeon Falls
15. Chalk Hill
16. White Rapids
17. Grand Rapids
18. Menominee (Upper)
19. Menominee (Lower)

MR. OEMING: All sources of municipal sewage and industrial waste discharges to these waters are covered. The nature of waste treatment or control measures in effect are described and the State agency action to control pollution and evaluate accomplishments is related.

The files and records of the Michigan Department of Health and Michigan Water Resources Commission are the sources of information contained in the report. The employed staffs of both agencies collaborated in assembling the material and in preparing the report. The chapter entitled "Statutory Authority, Policies and Procedures" was prepared by legal counsel for the Water Resources Commission, an Assistant Attorney General from the Attorney General's office

At this point, Mr. Chairman, I would like to present to you Chapter I, which describes the statutory authority, policies and procedures of the State agency.

Perhaps I had neglected to point out that the report, on the cover, is shown as being prepared by the Department of Health and Water Resources Commission of the State.

Chapter I relates the legal and statutory highlights of pollution abatement in Michigan and describes the energetic and effective policies and programs which have been developed by State agencies to combat water pollution.

L. F. Oeming

STATUTORY AUTHORITY, POLICIES AND PROCEDURES

This chapter relates the legal and statutory highlights of pollution abatement in Michigan and describes the energetic and effective policies and programs which have been developed by State agencies to combat water pollution.

LEGAL HISTORY

Prior to 1929 authority of the State of Michigan to abate pollution rested upon a basis of common law. In 1913 the Michigan Supreme Court held in *Attorney General ex rel Township of Wyoming vs. City of Grand Rapids*, 175 Mich. 503, that the State Attorney General acting under his broad common law powers had the authority to file suits on behalf of the State of Michigan to compel the City of Grand Rapids to abate the public nuisance that it was making in the waters of the Grand River by discharging raw sewage therein. In its decree the Supreme Court ordered that the City construct such works as were necessary to abate the pollution within one year.

In 1929 the Michigan Legislature enacted the Stream Control Commission Act (Act 245 P.A. 1929) establishing a 5-member Commission consisting of the Director of Conservation, the State Health Commissioner, the Highway Commissioner the Commissioner of Agriculture and the Attorney General. This Act defined unlawful pollution as the discharge to the waters of the state of "any waste or pollution of any kind that will tend to destroy fish life or be injurious to public health". The law further provided the Stream Control Commission with authority to ascertain and take appropriate action where existing conditions in any lake, river, stream or other waters of the state were deemed by the Commission to be unreasonable and against public interest. In order to insure compliance with Stream Control Commission orders, the statute provided for a formal notice, hearing and order procedure.

The constitutionality and authority of the Stream Control Commission to issue orders requiring the abatement of pollution of the waters of the state was reviewed in City of Niles vs. Stream Control Commission, 296 Mich. 650, decided March 11, 1941. In that case the City of Niles appealed from an order of the Stream Control Commission directing the city to begin construction of a sewage treatment plant for the purpose of preventing the discharge of raw sewage into the St. Joseph River. The Supreme Court sustained the authority of the Commission, validated its order and compelled the City of Niles to comply.

In the course of that decision the court made some notable observations, among which is the following:

> "In order to stop pollution of the river, it was necessary for the Commission to take action against the City of Niles, inasmuch as it was the first city in the State on the course of the river below the Indiana cities and thus open the way for suit to compel the Indiana cities to stop pollution of the waters of the river. It is an instance where the State must clean up its own door-yard before being in a position to ask or seek to compel its neighbor to clean up. This was not an arbitrary exercise of power by the Commission but a practical movement toward accomplishment of a most desirable end." (Quoted on p. 157, 305 Mich. Rep.)

However, the most notable series of cases involved the enforcement of the order which was issued by the Stream Control Commission against the City of Port Huron. On February 11, 1936, the Commission issued an order against the City of Port Huron requiring it "to proceed to the construction of a sewage treatment plant and the necessary collecting and intercepting sewers, pumping stations, force mains and other appurtenances in connection therewith, all when and as approved by the Michigan Department of Health to permit treatment for the sewage of the city before its discharge to State waters." The city failed to comply with this order and the Commission filed a bill of complaint on December 9, 1939, to enforce it. After an extended trial the Circuit Court denied the relief sought by the Commission and the matter was appealed to the Supreme Court. In the course of its opinion (Stream Control Commission vs. Port Huron, 305 Mich. 153), reversing the decision of the lower court and validating the order of the Commission, the Supreme Court referred to the argument made by the city that construction of the sewage plant would not materially reduce pollution in the river and that its present method of sewage disposal did not create a public nuisance to the people residing along the river as well as those in the cities of Marysville, St. Clair Marine City and Algonac situated within 30 miles below Port Huron. In disposing of this contention, the court stated (p. 157):

> "The record contains sufficient testimony to substantiate the State's contention that the present raw sewage disposal method is a constant menace to the health and well-being of the downriver communities as well as to tourists. This evidence clearly justifies the Commission's order. Under the authority of the City of Niles case, supra, where similar

> "arguments were advanced, it is no defense to a statutory charge of river-water pollution that others have or are contributing to that condition."

A contention made by the city consisted of invoking the doctrines of "balancing of equities" and "comparative injury." These doctrines are always invoked when a number of municipalities or industries contribute to the pollution of a body of water, each one claiming that it should not be required to abate its contribution to the pollution until the others are required to do likewise. In disposing of this contention the Supreme Court said (p.157-158):

> "Even if we should concur with the trial judge in his conclusion that a 'balancing of equities' favors the city, this is not a proper case for the application of that doctrine. The doctrine of 'comparative injury' should be confined to those situations where the plaintiff can be substantially compensated. This principle is distinguished in City of Harrisonville vs. W. S. Dickey Clay Manufacturing Company, 289 U.S. 334, 337 (53 Sup Ct. 602, 77 L. Ed. 1208)."

* * * *

> "The doctrine of 'comparative injury' should not be invoked to justify the continuance of an act that tends to impair public health."

Another contention made by the City of Port Huron was its financial inability to comply with the order. In disposing of this issue against the city, the court stated (p. 159):

> "The act creating the Commission was under the police power vested in the State, and the order in question was not arbitrary or unreasonable but became necessary by reason of the previous refusal of the city of Port Huron to stop pollution of the St. Clair and Black rivers. The evidence justified the order of the Commission, and the decree entered below must be vacated.
>
> "We are not unmindful of the situation caused by war conditions and the fact that the city of Port Huron will have difficulty in complying with the Commission's order due to necessary materials now required for war purposes. This, however, does not, and should not, prevent the city from immediately taking those steps necessary to insure the carrying out of the mandate of the Commission, but a reasonable time should be allowed for completion of the project. We apprehend that the State and city can agree upon the time that is necessary, and if they cannot, this is a matter which can be determined by the trial judge upon proper proofs."

The City of Port Huron, however, failed to comply with the order of the Supreme Court and consequently the Attorney General filed a motion for final process to enforce the decree. The court rendered its opinion in People ex rel Stream Control Commission vs. City of Port Huron, 323 Mich. 541. In a per curiam opinion reviewing the events that had occurred including reference to war conditions that had made it impossible for the city to procure necessary materials for construction and that time was required for this purpose, and pointing out that the city had authorized the issuance of bonds totalling $1,600,000 for construction of the sewage disposal plant, the court stated:

> "This phase of the situation presents a matter for practical consideration. The problem is one that cannot be solved other than by the construction of proper facilities necessary for the treatment of the raw sewage . . . The condition existing is one, as indicated in the prior opinion of this court, that should be remedied as soon as possible. If the course the city commission claims it is pursuing is followed with reasonable diligence, it seems clear that the desired result can be accomplished in the not far distant future . . . . It seems expedient now that a definite date should be fixed

> "prior to which the sewage disposal plant, the intercepting sewers and other necessary appurtenances shall be completed so that the existing situation may be ended.
>
> "The injunctive relief sought by the motion of the attorney general will be granted effective as of October 1, 1950."

Even this, however, did not end the controversy because the City of Port Huron experienced difficulty in selling the bonds to raise the money for construction of the works. Apparently the bonding houses wanted a decision from the State Supreme Court validating those proposed bonds. Consequently, upon the city treasurer's refusal to countersign the bonds, mandamus proceedings were filed by the mayor of Port Huron against him. The Attorney General intervened as plaintiff and the matter was decided by the Supreme Court in Port Huron Mayor vs. Treasurer, 328 Mich. 99. In its opinion the court reviewed the prior proceedings, the various resolutions and ordinances adopted by the city for the issuance of the bonds, and the court pinpointed the critical issue as follows (p. 106):

> "The most important question raised by the pleadings is whether the issuance of the general obligation bonds of $1,300,000 must be approved

> "by a 3/5 majority of the qualified electors of the City of Port Huron after due notice has been given to them in the same manner and to the extent that is required for issuance of other general obligation bonds issued under the charter of the city of Port Huron and by the home rule act."

The bonds had not been submitted to the electors for approval and thus the court was faced with the responsibility of deciding whether its previous orders could be complied with without reference to any referendum for the issuance of the bonds to raise the money needed for compliance with the orders of the Supreme Court. Act 320, P.A. 1927, authorized the legislative bodies of municipalities to issue and sell bonds necessary for the construction of sewage disposal plant "whenever a court of competent jurisdiction in this State shall have ordered the installation of a sewage or garbage disposal system in any of the governmental agencies or municipalities herein mentioned and the plans therefore shall have been prepared and approved by the state commissioner of health . . ."

Another statute known as the Municipal Finance Act, namely Act 373, P.A. 1925, contained the same provision with reference to the construction of "necessary storm and sanitary sewers."

After reviewing the various authorities, the court held that whenever a municipality finds it necessary to raise money for the issuance of bonds for the purpose of complying with a court order involving the public health of the State, no referendum of approval by the people is necessary. Its opinion on this point stated:

> "The action of the plaintiffs was in strict accord with our peremptory order for the installation of a sewage treatment system in Port Huron. The proposed bond issue was not to raise money for ordinary municipal purposes or improvements, but to carry out the order of this Court, and prevent defendant from further polluting public streams and endangering the health and comfort not only of its own inhabitants but also of all others in any way affected by the pollution of the waters by the filth from the Port Huron sewers. This no longer created solely a problem of Port Huron but one of the State and this may have been the reason for enactment of Act No. 320, supra, sections of which we have quoted. The order was for the protection of the people of the State of Michigan. It transcended local purposes.
>
> "Claims of defendant that notice and a vote of

> "the electors of Port Huron were necessary are fully answered by sections 7 and 8 of P.A. 1927, No. 320, supra. The city of Port Huron was bound to carry out the order of this Court, which confirmed the previous order of the Stream Control Commission. There was neither necessity, occasion, nor any reason to publish the resolution authorizing the issuance of the bonds, *nor, as previously stated, did it require the vote of 3/5 of the electors*." (Emphasis supplied).

Another point raised was that *the levying of the tax for the payment of such bonds would exceed the tax limitations provided by the city charter*. This is a contention which is usually made by municipalities whenever they are faced with complying with an order of the Water Resources Commission. In its opinion the court rejected this contention by holding that there is ample authority in Act 320, P.A. 1927, to levy taxes for the purposes mentioned in that statute; and that even though the tax limitations were exceeded, such defense was not valid when the city is required to comply with a court order.

The Supreme Court thereupon issued its writ of mandamus ordering the city treasurer to countersign the bonds and in due time the sewage disposal system of the City of

Port Huron was built and has been operating ever since.

In 1949 the legislature enacted Act 117 of the Public Acts of 1949 being entitled the Water Resources Commission Act. This statute abolished the Michigan Stream Control Commission and established in its place the present Water Resources Commission. To make up the membership of the newly created Commission, Act 117 added to the four hold-over ex-officio members heading the Conservation, Health, Agriculture and Highway Departments, three executive appointees (with Senate approval). The citizen members represent respectively, industrial managements, municipalities and organized conservation groups. The preservation and encouragement of member departmental activity in this field was contained as was authority to call upon "any officer, board, department, school, university or other state institution for any assistance deemed necessary to the carrying out of this Act."

The definition of unlawful pollution contained in Section 6 of the Water Resources Commission Act is one of the best in the country. That Section provides the following:

> "It shall be unlawful for any person to discharge or permit to be discharged into any of the lakes, rivers, streams or other waters of this state any substance which is injurious to

"the public health or to the conducting of any industrial enterprise or other lawful occupation; or whereby any fish or migratory bird life or any wild animal or aquatic life may be destroyed or the growth or propagation thereof be prevented or injuriously affected or the value of lawfully taken fish or game be destroyed or impaired as the consequence of said pollution. Any person who shall discharge or permit to be discharged any waste or pollution into any of the waters of this state, in contravention of the above provisions of this section, shall be deemed to violate the provisions of this act."

The series of cases previously referred to has paved the way for enforcement of Water Resources Commission orders made pursuant to Section 6 and has enabled Michigan municipalities to finance construction of projects necessary to comply with Commission orders. During the past 15 years numerous Court Orders have been secured against municipalities and during the past 8 years the Water Resources Commission has secured Court Orders directing the Menominee River area communities of Iron River, Stambaugh, Iron Mountain, and Kingsford to abate pollution of the waters of the State by the construction of sewage treatment facilities.

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In addition, the State Health Commissioner, acting pursuant to authority vested in him by Act 98, Public Acts of 1913 and Act 219, Public Acts of 1949, has prohibited the extension of municipal sewer systems and additional connections to existing systems where such is deemed necessary to control pollution and protect public health. The authority of the State Health Commissioner to so act has been upheld by Michigan court decisions. Today no municipality in the State of Michigan can plead that it is financially unable to comply with orders of the Water Resources Commission or the Michigan Department of Health. Financial inability in the State of Michigan is not a defense against the abatement of a nuisance either by private citizens or by a municipal entity.

A word about The Water Resources Commission now.

THE WATER RESOURCES COMMISSION - POLICIES AND PROCEDURES

The Michigan Water Resources Commission fosters the policy of each member agency as well as local governmental units and industries doing their utmost to so control waste substances as to prevent unlawful pollution as defined in Act 245, Public Acts of 1929, as amended. Pursuant to the foregoing policy the seven-member Commission:

1. Receives complaints of pollution and acts on reported findings.

2. Receives statements for new or increased use of waters of the State for waste disposal purposes, and acts on Order restrictions recommended by staff, except in case of municipal or other uses solely involving public health where the Commission relies on Health Department action.
3. Schedules and conducts preliminary information conferences as well as conferences "to show cause.
4. Orders preparation and adopts Notice of Determination and Hearing for problems not corrected or correctable through staff approach and effort; takes like action where necessary and when requested to support a member agency's efforts.
5. Holds statutory hearings on proposed Orders.
6. Adopts Final Order setting date for compliance following date for submission of plans and approval: These plans either to be submitted to:
   (a) State Health Commissioner for municipal sewage treatment.
   (b) Chief Engineer, Water Resources Commission, for industrial waste treatment.
7. Takes appropriate action on staff reports of failure to comply with previously adopted Orders by declaring default and referring problem to Attorney General for enforcement.

8. Passes on budget requests and proposed staff programs following legislative appropriation (with or without Federal program grant funds).
9. Determines priority of one eligible municipal project over another to qualify for Federal construction grant assistance.
10. Contributes toward the State's share of the U. S. Geological Survey program for stream gaging and lake level records.
11. Contracts with universities for conduct of research projects involving water resource evaluation.

WATER RESOURCES COMMISSION STAFF FUNCTIONS RELATING TO POLLUTION CONTROL

In order to support the policies and objectives of the Commission, the Commission's 35-member technical staff carry on the following functions:

1. Conducts field investigations to secure basic information and evidence, which includes pollution surveys to evaluate magnitude and extent of pollution problems.
2. Explores and evaluates polluting effects of wastes from new types of industries.
3. Receives and processes statements of new or increased use of waters of the State for waste

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disposal purposes, conducts related investigations and recommends appropriate waste restrictions to the Commission.

4. Investigates pollution complaints and reported fish or wildfowl mortalities.
5. Develops recommendations on necessary degree of treatment or time for compliance upon request of Commission.
6. Reviews and approves or rejects plans for industrial waste treatment or control facilities.
7. Makes regular inspections and performance surveys on existing industrial waste control facilities.
8. Counsels with management on industrial waste treatment or disposal problems.
9. Reviews and takes appropriate action on basis of industrial waste treatment plant operating reports.
10. Acts on matters referred from the Michigan Department of Health and Department of Conservation.
11. Performs work required in carrying out State functions under provisions of the Federal Water Pollution Control Act.
12. Cooperates with Federal and other State agencies in matters related to water pollution.

13. Provides Department of Conservation with stream survey information that might affect future fish plantings.

14. Represents the State's or Agency's interests at conferences and on committees concerned with water pollution and water resource matters.

15. Executive Secretary represents the interests of the Commission on the Advisory Board to the International Joint Commission on Control of Pollution of Boundary Waters.

MICHIGAN DEPARTMENT OF CONSERVATION - POLLUTION ABATEMENT ACTIVITIES

In addition to the functions carried out by the Water Resources Commission, Michigan law also provides authority for the conduct of certain activities related to pollution abatement by and under the supervision of the Director of the Michigan Department of Conservation.

The Department of Conservation organized and has conducted active oil field patrol and developed highly effective means of brine conservation and oil pollution prevention since 1939. In addition conservation officer field assistance has continued to support the Water Resources Commission staff efforts to control pollution. The Institute of Fisheries Research at Ann Arbor, Michigan, a part of the

Department of Conservation, has over many years made its laboratory and scientific knowledge available to provide the Water Resources Commission staff with fish tolerances and other information necessary to fish propagation and development. The Conservation Department is the single largest contributor to the State's share of the U. S. Geological Survey program of stream flow and lake levels investigation. The Department has recently been assigned the task of conducting a broad State recreational study and to prepare a recreational plan. Water quality information, coupled with unrelenting effort to improve such conditions where necessary by the Water Resources Commission and the Health Department, is of utmost importance to this program.

MICHIGAN DEPARTMENT OF HEALTH POLLUTION ABATEMENT ACTIVITIES

The State Health Commissioner, acting through his engineering staff, exercises supervisory control over all public sewerage systems. He is required by statute, Act 98, P.A. 1913, as amended, to "exercise due care to see that sewerage systems are properly planned, constructed and operated so as to prevent unlawful pollution of the streams, lakes and other water resources of the State." No public sewerage system may be built or altered without approval of the State Health Commissioner. In carrying out this responsibility the Health Department:

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1. Reviews, approves or rejects plans submitted for new municipal systems or changes in existing ones.
2. As agent for the Commission, reviews, approves or rejects plans submitted for all new sewerage systems or changes in existing ones, other than municipal.
3. Issues or withholds issuance of construction permits.
4. Counsels with officials of municipalities as to the collection and treatment of sewage. This activity is supplemented and strengthened by programs of local health departments to control the installation of private sewage disposal systems.
5. Consults, confers with and assists staff of Water Resources Commission in all phases of activities related to sewage treatment.
6. Conducts an educational program to foster and encourage the construction, utilization and effective management of adequate sewage collection and treatment works.
7. Conducts inspections to determine that construction conforms to approved plans.
8. Makes periodic inspections and exercises general supervisory control over plant personnel to assure effective operation of sewerage works at municipalities, institutions, trailer parks, schools and

9. Trains and certifies the competency of sewage plant operators.

10. Reviews and takes appropriate action on basis of monthly plant operating reports.

11. With aid of mobile laboratory conducts on-the-site municipal plant performance evaluations.

12. Orders changes in physical facilities or their operation to assure that sewage shall not be "potentially prejudicial to the public health."

13. Reports to Commission when municipal facility has been completed substantially in accordance with approved plans and specifications.

14. Refers appropriate cases to Water Resources Commission for action.

15. Director, Division of Engineering, represents the interests of the State Health Commissioner on the Advisory Board to the International Joint Commission on Control of Pollution of Boundary Waters.

OPERATION OF STATE PROGRAM FOR CONTROL OF WATER POLLUTION

The State of Michigan prides itself as being a leader for many years among the States in its energetic efforts and programs to improve water quality and banish pollution.

To our knowledge, the State of Wisconsin has also engaged in comparable activities to abate pollution of its waters.

While many tasks remain to be done, the programs which have been successfully completed and those now in progress in Michigan are impressive and evidence a long history of effective water pollution control. The water pollution control policies and programs of the State of Michigan recognize the many uses which water, our most precious resource, must satisfy. The needs of domestic water supply, industry, agriculture and recreation, including fishing, swimming and boating, must all be considered if water pollution control programs are to receive the public support and confidence required to carry such programs to successful completion. It has been the purpose of Michigan's control programs to effectively upgrade water quality in all areas consistent with local requirements and to abate unlawful pollution deemed to be unreasonable and contrary to the public interest.

Water pollution control is a never ending battle and as Michigan's population continues to grow, resulting in an increase in industrial and commercial development, many waters of the State will be subject to greater demands for waste assimilation purposes. However, the legal machinery provided by the State of Michigan is adequate to place under proper control any species of waste discharges whether domestic or industrial. In every instance where we have had to appeal to the Supreme Court of our State for enforcement of pollution control orders, our action has been upheld.

The record made by the State of Michigan clearly shows that the State has consistently followed effective abatement programs and evidences the readiness at all times of State enforcement agencies to initiate whatever action is required to correct violation of State law.

Now, with that, Mr. Chairman and conferees, I would like to call on Mr. Purdy.

MR. STEIN: May we ask first if there are any comments or any questions?

MR. OEMING: Fine. I am sorry.

MR. STEIN: I think we might follow that with each segment of the report.

MR. OEMING: Yes, sir. That is fine with me.

MR. STEIN: Are there any questions?

(No response.)

MR. STEIN: Largely for clarification, there is one point where you say, on Page 7, that your definition of unlawful pollution is one of the best in the country. I would agree with that.

Some people might say that is a self-serving statement, but I would not. However, it leads to many comments about what is your definition of pollution. If yours is one of the best in the country, I wonder why they don't adopt this?

MR. OEMING: Thank you.

MR. STEIN: And I don't think many of us would object, but I do have a question, coming down to the bottom of Page 7.

You say court orders have been secured against municipalities during the past eight years in the Menominee River communities of Iron River, Stambaugh, Iron Mountain and Kingsford.

MR. OEMING: Yes, sir.

MR. STEIN: Have these places complied with these orders, and are the works in operation?

MR. OEMING: Yes, they have.

MR. STEIN: The reason I raise this -- and it is mainly for clarification -- is because in the report of Health, Education, and Welfare it says there is bacterial pollution in the Iron River which contains treated sewage from the communities of Iron River, Stambaugh, Caspian and Gaastra, which presumably, according to our people or the report of our investigators, constitutes pollution.

I am just highlighting this and flagging this here.

If you have court orders against these communities and they have complied with the court orders, and if our investigators say that these areas or these communities are contributing discharges to the river which constitute pollution, I think that this may be one of the areas that the conferees are going to have to discuss.

MR. OEMING: Well, do you want me to comment on this?

MR. STEIN: Yes, we would be delighted.

MR. OEMING: Well, there is a court order. The court order is still in effect. They had built sewage treatment plants to abate the pollution.

Now, if a determination is made by the Commission that the pollution is not abated in accordance with the State law, then action would be taken under the existing court orders to require compliance, if it is found necessary and the pollution is in violation of the State statutes.

MR. STEIN: Yes. Evidently, our investigators said that this is treated sewage.

MR. OEMING: Yes.

MR. STEIN: The point is this: At least, I think it is not an imputation, but a pretty fair statement that the treatment, at least for one or more of these communities, in their opinion is not enough.

MR. OEMING: Well --

MR. STEIN: Again, I am not arguing, but just as the chairman, I think I have to point this out as one of the issues.

MR. OEMING: I realize what you are pointing out. That is anybody's prerogative, to decide if they don't like it, but the Commission is so bound by the statute it must make findings, and it has adequate proof to show that the injuries, which are defined in the definition of unlawful pollution, exist.

MR. STEIN: Yes.

MR. OEMING: And the fact that you have two coliforms more than somebody thinks should be there does not constitute an injury under the statute.

MR. PIERCE: Mr. Chairman.

MR. STEIN: Go ahead.

MR. PIERCE: I should just like to point out that later in our report there is a discussion of the adequacy of each of these plants, and I think that it might be a little better, in the interests of the conferees and everyone here, if we might defer any further comments on those until that report is given.

MR. STEIN: Yes. As I pointed out, I just wanted to flag it and not discuss it at this time.

I have just another question, and this is for clarification.

As I understand from your report, the Michigan Department of Health handles municipal systems?

MR. OEMING: Yes, sir.

MR. STEIN: Supposing industrial wastes, in part or in large measure, go into a municipal system, whose jurisdiction is that?

MR. OEMING: Our Department, the Health Department.

MR. STEIN: It is the Health Department?

MR. OEMING: Yes, sir.

MR. STEIN: Now, if the Health Department has jurisdiction over the municipal system, to go back to Page 9, the Water Resources Commission determines priority over eligible municipal projects to qualify for Federal construction grant assistance.

In other words, even though the Health Department is the agency that determines what should go into a municipal system, your Department determines the priority for that system?

MR. OEMING: That is right.

MR. STEIN: How does that work?

MR. OEMING: How does it work?

MR. STEIN: Yes. I mean, this is just --

MR. OEMING: I am puzzled. What do you mean by "How does it work?"

MR. STEIN: Well, it seems to me --

MR. OEMING: Remember, Mr. Stein, that the Health Commissioner is a member of the Commission also.

MR. STEIN: Yes.

MR. OEMING: And that the staffs of the Commission and the Health Department, as well as with other agencies involved in membership on the Commission, are not in a vacuum here. They are working together on these problems.

MR. STEIN: For example, do they get a permit before they come to you for priority, or afterwards?

MR. OEMING: They have to get it before they will qualify for certification by the State.

In the administration of the grant program, one of the rules is that they must obtain a permit from the Health Department before we will certify the project to the Department of the Public Health Service, so they must have a construction permit.

MR. STEIN: I see.

MR. OEMING: I don't know. Is this the point you wanted?

MR. STEIN: No. I just wanted to know who issued the permits.

MR. OEMING: The permit is issued by the Health Department.

MR. STEIN: This is all the Health Department?

MR. OEMING: Yes, sir.

MR. STEIN: Even though they have industrial wastes in the system?

MR. OEMING: Yes.

MR. STEIN: And the only permits you issue or have authority over are those industries which have separate outfalls or separate disposal systems?

MR. OEMING: We don't issue any permits, first of all.

MR. STEIN: Oh, you don't?

MR. OEMING: No. These are not in the nature of permits. There is no permit system in Michigan.

These are orders that if you use a river for waste disposal, then you must comply with certain requirements. This is not a permit.

MR. STEIN: Whether we call it a permit or not --

MR. OEMING: It still is a permit?

MR. STEIN: That's right. The only systems that you check and approve, as contrasted to the Department of Health, are industries having separate systems?

MR. OEMING: The Commission's staff issues, examines and approves plans on industrial waste treatment facilities that are discharged separately.

MR. STEIN: Separately?

MR. OEMING: Yes, sir.

MR. STEIN: I see.

MR. OEMING: And anything that is in the municipal system, under Act 98, the Health Commissioner must approve.

MR. STEIN: And both the Health Commissioner or your Commission either approves or rejects these plans?

MR. OEMING: Yes, that's right.

MR. STEIN: All right.

MR. OEMING: Either one. I mean, it depends on who has the primary jurisdiction in the case of the approval of the plan, and by statute the Health Commissioner has the specific authority over the municipal system. It was not the intention of the Water Resources Commission to supersede or take away anybody's authority of a member agency. It is a coordinating agency.

MR. STEIN: Does the Health Department have a permit system?

MR. OEMING: A permit system?

MR. STEIN: Or does it just work -- you said they had to have a permit first.

MR. OEMING: This is a construction permit. It is a construction permit.

MR. STEIN: Yes.

MR. OEMING: It approves the plans and gives them a permit to go ahead with the construction.

MR. STEIN: That is what I was referring to.

MR. OEMING: It is not a permit to use the water.

MR. STEIN: No. Pardon me. Maybe we were not precise enough. I mean a construction permit. Do you issue construction permits for separate industrial systems?

MR. OEMING: No.

MR. STEIN: You don't?

MR. OEMING: No.

MR. STEIN: In other words, the Health Department does issue a construction permit, but you don't?

MR. OEMING: No. We only examine it. We examine the plans and tell them our opinion and whether they are going to meet the requirements as established by the Commission, and if they build it and it doesn't, they have got to do something else.

MR. STEIN: All right. Thank you.

By the way, this is the first time I have really understood this, but I think we may need this in the future work.

Thank you. Will you proceed?

MR. OEMING: Then I would like to have Mr. Purdy take on from here. I will be back.

STATEMENT OF RALPH W. PURDY, CHIEF ENGINEER, MICHIGAN WATER RESOURCES COMMISSION

MR. PURDY: Mr. Chairman, conferees, ladies and gentlemen:

My name is Ralph W. Purdy. I am the Chief Engineer of the Michigan Water Resources Commission.

Mr. Chairman, I would ask that the full report presented be considered a part of the written record as made here today, even though portions are not read as a part of our oral presentation.

MR. STEIN: They will appear in the record as if read, without objection.

MR. PURDY: Thank you.

BACKGROUND

Basin Description

The head of the Brule and Menominee Rivers, Pendleton Creek, rises in Sec. 13, T.43N., R.37W., Iron County, and flows in a southerly direction to Brule Lake. The Brule River starts at Brule Lake and flows in an easterly direction to its junction with the Michigamme River. The Menominee River, formed by the joining of the Brule and Michigamme Rivers, flows southeasterly to Menominee, Michigan and Marinette, Wisconsin, where it enters Green Bay. The Brule and Menominee Rivers form a part of the boundary between Michigan and Wisconsin.

The Menominee River drains an area of 4,070 square miles with major tributaries as follows: Brule River, 1,052 square miles; Michigamme River, 726 square miles; Pine River, 574 square miles; Sturgeon River, 427 square miles; Pile River, 249 square miles; and the Little Cedar River, 146 square miles. The length of the Menominee River proper is 118 miles and it has an average fall of about 4.7 feet per mile. While the surface of the Menominee River drainage basin is largely glacial drift, the river and its branches flow over hard crystalline rocks for two-thirds of its length and over sandstone and limestone the remaining one-third. In many places, the bed of the river is worn down to these underlying rocks, developing numerous rapids and falls.

The Brule River drains a high undulating plateau that is primarily till plain and is characterized by lakes and swamps and bedrock at shallow depths. From Brule Lake to the junction with the Michigamme, a distance of 42 miles, the stream bed, composed mostly of gravel and boulders, falls 400 feet. Major tributaries of the Brule are the Iron and Paint Rivers, both draining areas entirely in Michigan. The Iron River drains a rugged 96.3 square mile area in southwest Iron County that contains numerous small lakes, ponds and undrained hollows. The Paint River drains a 648 square mile area with the topography and surface geology similar to that of the Brule and Iron River Basins.

The Michigamme River begins at Lake Michigamme and flows almost due south to the nominal head of the Menominee River. The fall in this 69-mile length of stream is about 420 feet. Lake Michigamme has a surface area of 4,360 acres and receives drainage from 193 square miles. The main tributaries to the lake, the Peshekee and Spurr Rivers, drain a high plateau that is mostly rock at or near the surface. The lower portion of the Michigamme Basin has topography and surface geology much like that of the Brule.

The Pine River, entering the Menominee from the Wisconsin side, has its source in the high plateau region just south from the headwaters of the Brule River. It has a total length of 53 miles and its bed is composed mostly of gravel and boulders. A fall of about 190 feet occurs in the lower 20 miles of its course.

The Sturgeon River, another Michigan tributary, drains a rugged basin that contains numerous potholes and small lakes.

The Pike River, which is about 48 miles long, drains a rugged region, in Wisconsin, containing extensive beds of granite which occasionally reach the surface in rock knolls and ledges giving rise to a number of small falls and rapids.

The Little Cedar River drains a long, narrow area in Michigan that parallels the Menominee River. Its topography is not as rugged as the other Menominee tributaries and it has no important falls.

Hydrology

The Menominee River basin is subject to a variety of weather -- extreme seasonal temperature variations, rain in the summer and snow in the winter, and many storm passages. The growing season varies from 110 days in the northern part to 150 days in the southern part of the basin. The annual average precipitation on the basin, above White Rapids, is about 30 inches. About two-thirds of the annual total occurs during the six-months period April through September. The usual amount of snowfall is between 50 and 60 inches.

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Fifteen gauging stations on the Menominee River and its tributaries are operated by the U. S. Geological Survey, three of these on the Menominee River proper. Records at stations near Florence, Wisconsin, and Koss, Michigan, are for 48 years and 50 years respectively, with the average discharge being 1,783 c.f.s. and 3,137 c.f.s. The drainage area at the Florence station is 1,780 square miles and at the Koss station 3,790 square miles. The flow is regulated by 19 hydroelectric plants and two reservoirs. Every major tributary except the Little Cedar River has at least one hydroelectric unit.

Because the flow in the Menominee River is regulated, instantaneous flow data are meaningless. Daily flow are more indicative of conditions as they exist and will continue to exist for some time. The maximum and minimum daily discharges for the Menominee River below Koss, Michigan, for the 50-year period of record are 33,000 c.f.s. and 162 c.f.s., respectively. The flow at Koss is 2,400 c.f.s. 50 percent of the time and 900 c.f.s. 98 percent of the time (See Figure 1). The most probable 7, 15 and 30-day low flows are 1,750 c.f.s., 1,780 c.f.s., and 1,900 c.f.s. The 20-year 7, 15 and 30-day low flows are 560 c.f.s, 665 c.f.s., and 755 c.f.s. (See Figure 2).

I would now like to call upon John Vogt, Director

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of the Division of Engineering, Michigan Department of Health, for the presentation of the water uses, municipal water supplies and public bathing.

STATEMENT OF JOHN E. VOGT, DIRECTOR OF THE DIVISION OF ENGINEERING, MICHIGAN DEPARTMENT OF HEALTH

MR. VOGT: Mr. Chairman, members, conferees, ladies and gentlemen, members of the conference:

WATER USES

Municipal Water Supplies

The only municipality in the watershed using surface water as its sole source of supply is Menominee. Here the city's drinking water is obtained from a 16-inch intake, 2,000 feet long, in Green Bay about one mile from the mouth of the Menominee River. An auxiliary intake is located inside the breakwater for use when frazil ice is troublesome at the usual source. Treatment consists of prechlorination, alum mixing and flocculation, and settling, followed by rapid sand filtration. Each of the six filters has a nominal capacity of 0.75 MGD; 750,000 gallons of treated water storage is provided at the filtration plant.

Water at the intake location in Green Bay is subject to influence from the Menominee River. The principal effect has been on color and coliform organisms. Color due to natural runoff is noticeable usually in the spring and fall of the year, and then this condition is handled quite easily by free chlorination and alum flocculation at optimum pH ranges. Although some increase in chemical application may be necessary to make the water esthetically pleasing during these periods of the year, this poses no particular problem.

The other quality factor subject to river influence is the coliform content of the bay water as received for treatment at the municipal filtration plant. This has been receiving attention for many years and under close scrutiny for the past fifteen years.

Long and short-term fluctuations in bacteriological quality are reflected in Table 1 in the appendix. This table represents the results of daily tests for the period beginning 1948. Each monthly figure was obtained by plotting the daily coliform index on logarithmic probability paper to determine the 50 percent probability value.

Bacteriological quality has improved in recent years. During 1952, over ten years ago, the maximum monthly mean coliform density for the year was 43,000/100 ml.

Marked improvement was realized in 1953 and thereafter so that the maximum monthly mean density has not exceeded 2,000/100 ml and has been well under that figure since 1953. The excellent quality of this raw water source gives the City of Menominee a water supply which is amenable to treatment with conventional methods.

This water treatment plant is under the supervision of an operator certified by the Michigan Department of Health, as required by statute. Monthly operation reports are submitted to that agency.

A sample of the monthly operation report is in the appendix, and should you refer to it, you will find that the data submitted is very comprehensive. It includes bacteriological data, chlorination, chlorine application, bacteriological data on both raw and treated water, and also probability plots of the results of daily coliform tests. These reports indicate satisfactory operation.

The rest of the public water supplies in the basin are from wells, with the exception of Iron Mountain and Norway. Both of these use inland lakes to supplement their well supplies. A summary of the public water supplies is shown in Table 2 in the appendix.

Public Bathing

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The suitability of natural waters for swimming, water skiing and other forms of close contact recreation is dependent upon many characteristics of the water and of the stream or lake which contains it. Among these are water temperature, color and turbidity, depth of water, bottom materials and physical obstructions such as submerged rocks, deadheads, snags, etc. The presence of sewage as determined by sanitary surveys and confirmed by certain bacteriological analyses is the principal yardstick by which hazards to public health are measured.

It is universally agreed among public health investigators of bathing water quality that the sanitary survey of sources of pollution which may reach bathing areas provides the most reliable basis for determination of the extent of endangerment of the public health. It is equally well agreed that bacteriological analyses often provide valuable information to support and supplement the findings of the sanitary survey. Unfortunately, however, as pointed out in the U. S. Public Health Service report on bacteriological and epidemiological studies of bathing waters of Lake Michigan entitled "Tri-State Survey of Lake Michigan Waters (1498)," no correlation could be established between the concentration of bacteria, as determined by standard methods of analysis, and effects on health of

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persons swimming in such waters. This report and subsequent reports issued by the Public Health Service recognized that it is impossible to establish a numerical standard for bathing water quality in terms of bacteriological concentration. It is well known that many areas of the country have included some numerical value as a guide line or objective based upon local needs and conditions. A wide range in values is in use by various municipalities, State regulatory agencies, interstate compact groups, and others. Usually these numerical parameters are based on the most probable number per 100 ml of sample of organisms of the coliform group, although the more tedious test for organisms of Escherichia Coli subgroup or so-called "fecal coli" provides more significant information. Even this test includes organisms found in animal as well as human intestines.

To emphasize this point, I would like to quote briefly from the Department of Health, Education, and Welfare Public Health Service Bulletin on Drinking Water Standards, 1962, in which, in a discussion in that particular publication, on the coliform group and fecal coliform organisms as indicated in the pollution of drinking water, there is a section on sanitary significance, which I quote:

"Information on the sanitary significance of the various types of coliform organisms is "incomplete. In relation to untreated waters, however, the present position may be thus stated. Fecal coliform organisms may be considered indicators of recent fecal pollution. No satisfactory method is currently available for differentiating fecal coliform organisms of human and animal organs."

The entire coliform group includes several subgroups found in soils and elsewhere outside warm-blooded animals, thus having no public health significance of themselves.

Thus it is clear that the standard tests for bacteriological concentration developed for these purposes do not, of themselves, provide a reliable measure of water quality. The effects of land wash, certain nutrients for regrowth of the organisms and other variables, may often yield a distorted picture of actual conditions. An interesting example of this is cited in the aforementioned Tri-State Survey of Lake Michigan Waters. At Whiting, Indiana, samples of lake water showed enterococcus organisms of extremely low concentration never exceeding 3.6. To quote from the report, "coliform densities as high as 11,000,000 per 100 ml were found in this area where the water had none of the obvious characteristics of sewage. It is postulated "that the corn sugar waste from The American Maize Products Company may induce coliform growth in the lake itself." This serves to emphasize the need for the exercise of judgment based upon all of the pertinent facts rather than some arbitrary numerical yardstick in determining whether water quality is suitable for swimming or other recreational uses.

Little, if any, organized swimming is practiced in the Menominee and Brule Rivers. Some casual swimming and other contact recreation is known to exist. Cold water temperature, colored water and physical characteristics which make these waters unattractive for these uses, coupled with relative remoteness or inaccessibility of many reaches of the stream, are largely responsible for this. In spite of this low degree of exposure, however, the State Health Department has required all communities operating sewage treatment plants to install adequate facilities for effluent disinfection and to operate them effectively. Such facilities are in operation at all except four communities which serve a total of less than 2,500 people. These communities have been required to install such facilities and will have the same in operation by the summer of 1964.

Mr. Chairman, this is the answer to your question that you raised a little while ago with Mr. Oeming.

MR. STEIN: Are these the same four communities?

MR. VOGT: Well, basically. Three of them are. Three of them are the communities to which you had previously referred. We will get into those further.

MR. STEIN: I would like to make a correction here for Mr. Oeming to correct.

I believe I asked you the question whether the plants were completed and in operation, and the answer, as I recall it, was "yes."

I take it that they will not go into operation until 1964?

MR. OEMING: They are not the same plants.

MR. PIERCE: These are not the same plants.

MR. STEIN: These are not the same plants?

MR. PIERCE: We will get into this later.

MR. STEIN: All right.

MR. VOGT: Present controls in all plants equipped with effluent chlorination facilities are considered to be adequate and to be operated adequately to protect the public health under present conditions of use. Further refinement of control procedures will be required by the Department if and when needed so that the public health will continue to be protected.

There are only four public bathing beaches that are or could be influenced by the waters of the Menominee and Brule Rivers. Three of these beaches are at Menominee on Green Bay and one at Kingsford on Cowboy Lake. The beach nearest the mouth of the Menominee River is at the south end of the yacht harbor. The one most distant is at Henes Park. As shown by the U. S. Lake Survey Chart No. 723, the Marina Beach is a mile from the point where the Menominee River joins Green Bay. Cowboy Lake is part of the backwater formed by the Kingsford dam. Samples are collected routinely from the Green Bay beaches by the County Health Department Sanitarian. Bacteriological analyses on these samples are performed at the State Health Department Laboratories in Powers. The number and frequency of sampling and testing varies from year to year. Samples are collected from about mid-June until late August. The following summary represents all samples so analyzed during the period 1960-63.

The only comment on this table that is listed is you will note, with the exception of one sample in 1960, all of the samples are very low, in most instances below about 300.

BEACH	M.P.N. - Coliforms/100 ml							
	Median				Mean Density (50% Probability)			
	1960	1961	1962	1963	1960	1961	1962	1963
Marina	1380	210	230	230				
Memorial	930	190	430	150	420	135	230	105
Henes Park	122	43	-	43				

These concentrations of coliform group organisms are well below those generally considered acceptable for swimming and other forms of intimate body contact recreation. The extent of control exercised at the Menominee sewage treatment plant for bacteriological destruction, when coupled with the low coliform concentrations observed at the beaches indicate that, insofar as the Menominee sewage treatment plant is concerned, these waters are protected adequately for swimming and other forms of aquatic recreation.

Samples collected from Cowboy Lake by the County Sanitarian in 1961, 1962 and 1963 show the coliform group organisms range from a low of 9.1 per 100 ml to a high of 240 per 100 ml, again indicating good water for swimming and other forms of body contact recreation.

At this point I will now introduce Mr. Gordon Solberg, who is a civil engineer with the Hydraulic Division of the Water Resources Commission.

MR. STEIN: Mr. Vogt, that was a very good report. Are there any comments or questions?

(No response.)

MR. STEIN: I have just one question on your last statement, and I am sure you can answer this:

You say that samples collected from Cowboy Lake in 1961, 1962 and 1963 show that the coliform group organisms range from a low of 9.1 to a high of 240 per 100 ml, indicating good water for swimming and other forms of body contact recreation. As far as I know, that is generally accepted.

However, the question I have is, how can we accept a numerical count like this as indicating it is good, and not accept the numerical count as high, as indicating it is bad?

MR. VOGT: As I pointed out before, we cannot in any way accept an arbitrary value in and of itself; that it must be coordinated with a sanitary survey, and we have done so in this judgment.

MR. STEIN: I would agree with that. You mean these low counts coupled with the sanitary survey indicate that?

MR. VOGT: That is correct.

MR. STEIN: Not just the count itself?

MR. VOGT: That is correct.

MR. STEIN: Right. That is what I thought the situation was. Thank you.

STATEMENT OF GORDON SOLBERG, CIVIL ENGINEER, HYDRAULIC DIVISION, MICHIGAN WATER RESOURCES COMMISSION

MR. SOLBERG: Mr. Chairman, conferees, and ladies and gentlemen:

Industrial Water Use

Four industries use water directly from the Menominee River and its tributaries in Michigan. The Hanna Mining Company uses 670,000 gallons per day from the Iron River at Stambaugh for gravel washing and ore drilling and 1,900,000 gallons per day from the West Branch of the Sturgeon River at Randville for ore processing. The Marquette Iron Mining Company uses 20,160,000 gallons per day from the Michigamme River for ore processing at Republic and the Marathon Corporation uses 9,630,00 gallons per day from the Menominee River at Menominee for manufacturing, cooling and refrigeration. The remaining industrial water use is from wells or public supplies. A summary of all industrial water use is shown in Table 3.

Irrigation Water Use

There are 25 irrigation systems irrigating 776 acres in the Michigan portion of the basin, requiring 287 acre-feet of water per year. Seventeen of these systems use surface water sources, seven use city water, and one uses ground water. Of the 17 surface sources, two systems irrigating 19 acres use water directly from the Menominee River.

Hydroelectric Development

There are 19 hydroelectric plants (See Table 4) on the Menominee and Brule Rivers and their Michigan tributaries. Thirteen of these units are owned and operated by the Wisconsin-Michigan Power Company, two by the Marinette Paper Company and one each by Cleveland Cliffs Iron Company, City of Crystal Falls, City of Norway, and the Wisconsin Public Service Corporation. These units utilize a total head of 785.5 feet to develop over 148,000 horsepower. The installed capacity of these plants varies from 100 kw to 16,000 kw with the total being 83,465 kw. Most of the units operated by private utilities are used for peaking purposes. While the storage at most sites does not allow a shutdown for more than a few hours, the flow rates usually vary from a few cfs to near capacity each day except during periods of excess flow. Two of the units, Peavy Falls and Way Dam, on the Michigamme River have a combined storage of 153,800 acre-feet which is used to capture excess spring runoff for release during periods of low flow (summer, fall, and winter).

Access and Development

The Iron River, from its headwaters until it reaches the outskirts of the City of Iron River, is not easily accessible -- only five road crossings and no public fishing sites. The river flows through the cities of Iron River, Stambaugh, and Caspian. Most of the river frontage is undeveloped or occupied by railroad yards and abandoned mining company property. From the City of Caspian to its mouth, the Iron River is noteasily accessible.

The Brule River flows through a very sparsely populated area that is mostly undeveloped. Scattered farms and private hunting and fishing camps are located along its banks. Public access is provided by two public fishing sites and easements for fishing along one-half mile of river frontage.

From the confluence of the Brule and Michigamme Rivers to the Iron Mountain-Kingsford area the Menominee River flows through sparsely populated areas with occasional fishing or hunting camps and farms along its banks. A "River Boat Cruise" is operated on the backwater of the Twin Falls Dam during the tourist season. Four public fishing sites and two parks provide access to the river in this reach. From the Iron Mountain-Kingsford area to the mouth, seven public fishing sites and two parks provide public access to the river. Certain sections of the river frontage in this lower reach contain numerous homes and summer cottages.

Sport Fishing

The sport fishery of the Menominee River system affords a true cross-section of Great Lakes area fishing -- trout fishing in headwater tributary streams of the Brule, Iron and Paint; lake fishing on the reservoirs for both game and pan fish; and river fishing on the lower reaches from the bank and boat (See Figure 3). There appears to be no very marked change in the types of fish caught in the respective stretches of the river during the past 30 years. Creel census data for the sport fishery on the Menominee River are available since 1928 for the lower river and since the 1930's for most of the rest of the system. Although the use of creel census data is subject to definite limitations in making certain evaluations of a fishery, it is an accredited method of appraising the composition of fish populations and the sport fishing quality of a given water.

The Menominee River, along its main stem, may be characterized as a warm water fishery. Almost 50 percent of the catch has been perch, walleyes, and northern pike. Out of a reported total of 7,342 fish, 21 were trout.

The bulk of the catch on the lower river (Menominee County, Michigan) has been comprised of the following (1928-1962):

Smallmouth bass	3 %
Rock bass	9.4%
Perch	9.4%
Walleyes	15.3%
Northern pike	19.3%
Bullheads	19.3%
Suckers	14.6%

The upper main stem (Dickinson County, Michigan) has had a slightly different harvest (1934-1962) of warm water fish, the difference in composition is probably influenced by the large amount of impounded water in this stretch of the river.

Smallmouth bass	5.2%
Largemouth bass	5.2%
Bluegill	10.5%
Rock bass	4.6%
Crappies	13.2%
Perch	26.8%

Walleyes	17.4%
Northern pike	13.6%

The Michigamme River, although yielding some trout six percent of the total catch in Marquette County, is similar in yield of species to the Menominee River. Crappies, perch, walleyes and northern pike constitute the bulk of the harvest and this is the case both from the river and the two major impoundments -- Peavy Pond and Michigamme Reservoir.

The Brule River in Michigan is a trout stream as indicated by creel census, 1,411 total reported fish with 1,336 of them being trout. Seventy-five percent brook trout (1930-62) and the remainder brown and rainbow trout. Brule Lake, however, yields mostly bass, perch and northern pike.

The Iron River is very similar to the Brule, and the harvest has been almost identical, i.e. mostly brook trout.

Records show that the Michigan Department of Conservation has planted trout at a number of places, along the Paint, Iron and Brule Rivers, and their respective tributaries since 1921. The Department's management program indicates these plantings will be continued.

Thank you.

MR. STEIN: Thank you.

Are there any comments or questions?

MR. OEMING: No questions.

MR. STEIN: I have the usual one. Maybe you can clear this up.

In the Health, Education, and Welfare report on the Brule River, they say that for approximately fourteen miles, gravel areas on the bottom of the river are cemented together with iron deposits, which drastically reduce desirable fish food organisms and interfere with fish spawning.

Let's assume that this condition has been largely corrected.

No. 1, do you agree with this, and do you believe that this situation, if it exists, will correct itself, or something has to be done about it?

MR. PURDY: Mr. Stein, I would prefer that that question be delayed until our aquatic biologist appears.

MR. STEIN: We will be happy to do that. Thank you.

MR. SOLBERG: I would like to turn this back to Mr. Vogt.

MR. STEIN: Yes, sir.

Mr. Vogt, before you continue, could we go back and get something cleared up with relation tothis?

When you dealt with Marina Memorial in Henes Park, you dealt with mean densities. Then, when you got into the other part, on Cowboy Lake, you dealt with ranges. This somewhat puzzles me and this may come up in the report.

Is there a reason for one time picking mean densities and the other time ranges, or is there no reason for it? Or, doesn't it make much difference?

FURTHER STATEMENT OF JOHN E. VOGT,
DIRECTOR OF THE DIVISION OF ENGINEERING,
MICHIGAN DEPARTMENT OF HEALTH

MR. VOGT: I don't know that it matters a whole lot. It just so happens that in this table, we didn't elect to include all of the entire range of all of the samples that we collected, and we only selected the mean densities. In this other example we just included the ranges.

Now, I suppose we could have collected mean densities here, which would have been in conformity here, but I think you would recognize that if the range is from 9.1 to 240, the mean density would be even less than, at least, most of these reported here.

MR. STEIN: I think you have made the point with both sets of figures.

The question that we get in these reports is why the determinations or the basis for determination, and whether there is a reason for it.

MR. VOGT: No particular reason.

MR. STEIN: No particular reason. All right. Thank you.

MR. VOGT: May I proceed, Mr. Chairman?

MR. STEIN: Yes, I wish you would.

MR. VOGT: Thank you.

MUNICIPAL SEWAGE COLLECTION AND TREATMENT

Consistent with the legal responsibilities of the State Health Commissioner, discussed in Chapter I, all sewage treatment facilities in the State have been approved by the Department. Engineers of the Escanaba office make regular visits to observe treatment devices and their operation. They require such reports (See sample report in Appendix B) as appear necessary and desirable to be submitted monthly by the person responsible for operation and exercise such supervisory control as may be required in the operation and management of all facilities for the control of pollution

The Menominee River Basin extends into the Michigan counties of Menominee, Dickinson, Iron, Marquette, and Baraga. The orientation of these tributaries and the communities located along them is shown diagrammatically in Figure 4.

Some basic data on the sewerage systems of these communities is summarized in Table 5. Based on 1960 census figures, the Michigan part of the Basin contains an estimated total population of 62,500, of which 40,399 persons are in the thirteen communities served by public sewers. One incorporated community has no sewer system; its 296 residents rely on individual household disposal methods. The status of pollution control is outlined in Table 6 and the descriptive sections of this report.

I will not refer any further to Table 6, because it merely summarizes the narrative which I will now proceed to give.

As far as the Menominee River is concerned, the first communities which I will discuss are Iron Mountain and Kingsford.

A joint board provides a single treatment plant for the two cities, which together have a population of about 14,400.

Pollution control was established in 1960 in conformity with an Order of the Michigan Water Resources Commission which was affirmed by Circuit Court decree.

The plant is well and capably operated by a superintendent and other employees who have been certified as to competency by the State Health Commissioner. The operation reports submitted regularly to the State Health Department include the results on routine bacteriological samples from the chlorinated sewage effluent, and in addition to the results of routine bacteriological analyses, there are many other analyses that are made and recorded and submitted to the State Health Commissioner, as you would note if you would refer to the example of the monthly operating report from Iron Mountain-Kingsford for the month of September, 1963, which is a part of the appendix. It might be interesting to point out that during the month of September there were four samples collected of the plant effluent and analysis made for coliform indices. These four results are listed on the report, and with respectively 23 coliforms per 100 ml, less than 3, less than 3, and 5.1, which I think is pretty good sewage treatment plant effluent bacteriologically.

Treatment facilities are adequate and have reserve capacity to serve an additional population of 5,700.

A sewer separation project is currently under way in Iron Mountain, and when completed in 1964, approximately 60 percent of the sewage collection system in the city will be of a separate type.

Also, an appropriate note should be added to Table 5 in the last section of this report under the description of the Iron Mountain sewer system, changing the statement from a combined sewer system to a separate and combined system.

MR. STEIN: Are there plans, Mr. Vogt, for 100 percent separation, or do you think that is sufficient?

MR. VOGT: Not at the present time. We haven't felt that that was necessary. We haven't determined any further than that.

MR. STEIN: Thank you.

MR. VOGT: Menominee:

The population of the city is about 11,000. Virtually all occupied properties are connected to the sewer system. Pollution has been controlled since 1940, when a primary treatment plant with effluent disinfection was placed in service. The plant is well and capably operated by a superintendent and other employees who have been certified as to competency by the State Health Commissioner. The operation reports submitted regularly to the State Health Department include the results on routine bacteriological samples from the chlorinated sewage effluent. Treatment facilities are adequate.

NORWAY

The city's population is about 3,200. Approximately 70 percent of the occupied properties are connected with either combined types of sewer systems; and also an appropriate change should be made in Table 5 to show that 70 percent of the city is sewered and serving a population of 2,100, rather than 100 percent of the city being served by sewers.

Unlawful pollution as defined by Michigan statute has not been determined. However, engineers were employed in 1961 and a report on sewage treatment was submitted to the State Health Department in 1963. The discharge of sewage into a small tributary of the Menominee River has been under continual surveillance. Until it can be established that unlawful pollution is occurring, the State regulatory agencies will continue to promote the voluntary construction of sewage treatment facilities. It should be emphasized that no permits for new sewer construction are being issued by the Michigan Department of Health to extend the present sewer system.

LITTLE CEDAR RIVER

DAGGETT

The village has a population of about 300. No formal public sewer system exists. Most occupied properties are served by private sewage disposal systems consisting of septic tanks and tile fields.

STEPHENSON

The village population is about 800. Practically all occupied properties are connected to the separate sanitary sewer system.

Pollution control was established in 1939, when a secondary plant of the standard rate trickling filter type was completed. In accordance with an agreement between the village board and the State Health Commissioner, construction of additions, including a high rate trickling filter, heated sludge digestion, and disinfection facilities is now under way.

The plant superintendent has been certified as to competency by the State Health Commissioner. When completed in late 1963, the expanded plant will be adequate for an additional population of 700.

MICHIGAMME RIVER

REPUBLIC TOWNSITE

This unincorporated village has a population of about 200. All occupied properties are connected to the separate sewer system.

Pollution control was established when the community was created in 1956. It consists of treatment in a septic tank plant with effluent disinfection. Existing facilities are adequate and have reserves for an additional population of 800.

PAINT RIVER

CRYSTAL FALLS

The city's population is about 2,200. Ninety-five percent of all properties are connected to the combined type sewer system.

Continuing surveillance has failed to establish that there is unlawful pollution according to Michigan statutes. However, in 1958 the city employed consulting engineers to prepare a preliminary report on sewage interception and treatment.

The State pollution control agencies are continuing to encourage the construction of sewage treatment facilities. No permits for new sewer construction are being issued by the Michigan Department of Health.

I think these points, Mr. Chairman, emphasize and answer your question about construction permits, as far as municipal facilities are concerned.

The State Health Commissioner does issue construction permits, and a construction permit must be in the hands of the community before construction may proceed.

MR. STEIN: Yes. That is what I thought it was. I really didn't mean permits to pollute the streams.

(Laughter.)

MR. VOGT: Thank you.

ARMSTRONG CREEK

ALPHA

This incorporated village has a population of about 300. Virtually all occupied properties are connected to the combined type sewer system.

Pollution control was established in 1932 when a septic tank was completed. The Department of Health has pointed out the need for effluent disinfection and this has been recognized by the village board, which is presently interviewing consulting engineers about designing the necessary equipment and plant additions. The improvements, which are to be completed in 1964, will make the treatment facilities adequate for an additional population of 200.

IRON RIVER

CASPIAN

The population of this city is about 1,500. Ninety percent of all occupied property is connected to the sanitary sewer system.

Pollution control was established in 1928 when an Imhoff tank was completed. The Michigan Department of Health has pointed out the need for effluent disinfection, and the city has employed consulting engineers to prepare the necessary plans and specifications. It is expected that these facilities will be completed in 1964. The city has been advised that there is no reserve capacity in the existing plant.

GAASTRA

The city has a population of about 600. Virtually all occupied properties are connected to the sanitary sewer system.

Pollution control was established in 1928 when a septic tank was completed. The effluent flows approximately three-fourths mile and dissipates in a swamp bordering the Iron River. The Michigan Department of Health has pointed out the need for effluent disinfection, and the

J. E. Vogt

city has employed consulting engineers to prepare the necessary plans and specifications. Completion of the improvements is scheduled in 1964. The other facilities for treatment are adequate for an additional population of 100.

I should like to emphasize at this point that the calling of this conference by the Secretary of the Department of Health, Education, and Welfare, had no bearing whatsoever on the action of the State Health Commissioner in ordering the three communities, which I have just referred to, to disinfect the effluent from their sewage treatment plants.

These orders were issued in advance of the call of this conference and had no bearing or connection whatsoever.

IRON RIVER

The population of this city is about 3,800. Virtually all occupied properties are connected to the combined type sewer system.

The settled, though unchlorinated, sewage from approximately 25 homes in the Virgil location reaches the stream above the city's treatment plant. The condition is to be eliminated by a sewer interception project which is scheduled for completion in early 1964.

Pollution control was established in conformity with an Order of the Water Resources Commission, affirmed by Circuit Court decree, in 1959, when a primary treatment plant with effluent disinfection was completed.

The plant is well and capably operated by a superintendent who has been certified as to competency by the State Health Commissioner. Existing facilities are adequate to serve an additional population of 1,200.

MINERAL HILLS

This incorporated village has a population of about 300. About 75 percent of the occupied properties are connected to the separate sewer systems. Shown on a table in the report are the population of each mining location served, the type of treatment, and the type of effluent disposal. Three of the systems discharge to the Iron River through ditches.

Mine Location	Population Served	Treatment	Discharge
Homer	63	Septic tank	Ditch
Michaels	56	Septic tank	Ditch
James	42	Septic tank	Tile field
East James	28	Septic tank	Seepage pit
Spies	228	Septic tank	Ditch

Following cessation of mine water pumpage to dilute the septic tank effluent from the Homer, Michaels, and Spies locations, nuisance conditions have developed. The village has recognized this problem and is presently taking steps to obtain property to build tile fields for each of these locations.

STAMBAUGH

The city has a population of about 1,900. Virtually all occupied properties are connected to the sanitary sewer system. In conformity with an Order of the Water Resources Commission, affirmed by Circuit Court decree, pollution control was established in 1959 when an activated sludge treatment plant with effluent disinfection was completed.

The plant is well and capably operated by a superintendent who has been certified as to competency by the State Health Commissioner. The facilities are adequate for an additional population of 1,100.

I would like to turn it back now to Mr. Purdy, unless you have some questions.

MR. STEIN: Thank you.

Are there any comments or questions?

(No response.)

MR. STEIN: I would like to make one thing clear for the record.

We are not to draw any inference, I take it, where you have left out the phrase that a plant is well and capably operated? You didn't say anything, but I don't think we should draw the negative inference from the fact that these are not indicated with some plants.

MR. VOGT: That is correct. In other words, those facilities which may need some improvements, the facilities which are present are still capably operated.

MR. STEIN: That is the point I wanted to make and I didn't want anyone to --

MR. VOGT: I would not want to leave that impression either, Mr. Stein. I am happy that you raised that question, Mr. Chairman.

MR. STEIN: Are there any questions?

MR. OEMING: Mr. Pierce had something.

MR. STEIN: Mr. Pierce.

MR. PIERCE: I just wanted to make this comment and supplementary explanation to the last question.

There are, as you have noted, some facilities -- very simple, rudimentary facilities -- septic tanks -- at Alpha and Gaastra.

It is perhaps stretching things a little bit to say that you well and capably operate a septic tank, and for this reason we did not make the statement, although we can affirm that whatever operation is necessary for those facilities is provided.

MR. STEIN: Yes. I think we have to relate that to the situation, but I didn't want the implication there, since this phrase appears so frequently for these other communities, and I did not want anyone to feel that there was any implication that they were not well and effectively operated as existing facilities.

MR. VOGT: And we didn't put these in just to be repetitious, Mr. Chairman, but, rather, this is our best engineering judgment as to the operation of these facilities. They are in there for a reason.

MR. STEIN: I am sure that is correct.

Are there any more comments or questions?

(No response.)

MR. STEIN: If not, I think we will stand up and stretch for five minutes or so before we continue.

(Whereupon a recess was had.)

MR. STEIN: Mr. Oeming?

MR. OEMING: Mr. Chairman, at this time, in order to accommodate those people who have come from long distances to present a statement to the conferees, I suggest that we interrupt the State's presentation, the presentation of the State's report, in order to permit these people to present their statements, and then we will resume later the presentation of the State's report.

MR. STEIN: Without objection, that will be done, Mr. Oeming. Proceed.

MR. OEMING: In this event, Mr. Chairman, as I announced at the beginning, the Commission staff sent a letter to some 75 people, industries and communities, and invited them, if they wished, to make statements to the conference.

The first of these replies that I have here is one from the Wisconsin-Michigan Power Company, signed by W. E. Raffin, Superintendent of Power Production.

Is Mr. Raffin in the room? Mr. Raffin, would you like to give your statement at this time?

STATEMENT OF W. E. RAFFIN, SUPERINTENDENT, POWER PRODUCTION, WISCONSIN-MICHIGAN POWER COMPANY

MR. RAFFIN: Mr. Chairman, ladies and gentlemen:

My name is William Raffin, Superintendent of Power Production, Wisconsin-Michigan Power Company.

I am presenting a statement here, or several statements, in behalf of my company concerning this conference.

Wisconsin-Michigan Power Company is an electric utility which owns and operates thirteen hydroelectric plants and one storage reservoir on the Menominee River and a number of tributaries, including the Brule, Michigamme, Paint, Pine, and Sturgeon Rivers. Total drainage area of the Menominee River Basin is approximately 4,100 square miles. Approximately 78 square miles of land required for the company's developments is owned in fee by the company and flowage rights as required are owned on the balance of the necessary flowage lands.

Except during periods of excessive flows, the entire river flow at the individual plants passes through hydraulic turbines which turn generators to produce electric energy. No known chemical or physical change in the water takes place during this passage. Water in excess of plant capacity is passed through one or more Tainter gates or over an open spillway at the individual plants.

Operation of the company's system of hydro plants and reservoirs permits river control calculated to be desirable, not only to other industrial users, but also for conservation, recreation and sanitary purposes as well by affording a degree of flood control during periods of excessive flows, and by increasing natural flows during periods of deficient runoff. This is accomplished by ponding and releasing storage at appropriate intervals. It can best be shown by pointing out that during July and August, 1963, when precipitation was only 63 percent of the long-term average, the average regulated flow in the Menominee River was 1,188 cubic feet per second at the Twin Falls plant. This is 421 cubic feet per second more than the 767 cubic feet per second average natural flow existing during that period, the increase representing Michigamme Reservoir storage released. The company cooperates with State, municipal and industrial agencies to regulate river flow, insofar as is practical, for the best interests of all concerned.

Wisconsin-Michigan Power Company has been practicing conservation of natural resources for many years and this practice includes making its shoreline property available to all who enjoy the outdoors. Recreation enjoyed by the public includes such activities as picnicking, fishing, swimming, boating, hunting, and winter sports. The attached brochure, "A Place To Fish - Guide Map To The Heart Of The North," encouraging public use of company lands has been widely circulated to the public over the last nine years, during which time about 40,000 copies have been distributed free of charge.

I would like to add that we have copies of this brochure, should anyone want one.

Water surface areas of impoundments at the plants vary from approximately 75 to 7,000 acres. The company follows a policy of preserving the shorelines in their natural state by maintaining shoreline control. Certain premises are leased to public and private agencies, such as the Girl Scouts, for public recreational use.

The company has independently, or in cooperation with various public agencies, provided, and is contributing to the maintenance of more than 30 boat landings and access areas on its land, thus affording convenient access for recreational purposes to its approximately 16,000 acres of ponded water surfaces.

An active reforestation program is also pursued by the company, as evidenced by the one-half million trees that have been planted and are being cared for in various plantations on its lands. Planting is being continued at the rate of over ten thousand new trees annually.

Summarizing the above, the policy of Wisconsin-Michigan Power Company in use of its hydroelectric plant development lands and waters of the Menominee River Basin is one of permitting and encouraging the use of such lands and waters for recreational purposes by the public.

The company through its representative wishes to state that this conference did not originate as a result of any complaint by it and that we know of no condition of these waters endangering the health and welfare of the public. In regard to the report entitled, "Report On Pollution Of The Interstate Waters Of The Menominee And Brule Rivers," by the U. S. Department of Health, Education, and Welfare, we would like to point out certain passages of interest to the company.

1. On Page 9 it is noted that none of the dams includes facilities for passage of migrating fish. The company's Chalk Hill and White Rapids Plants originally included fishways, which were discontinued when it was found that fish did not use them.

2. On Page 10, it mentions that there are no known beaches on the Menominee. The company has leased lands to the City of Kingsford for a beach on Cowboy Lake at Kingsford, and to the Girl Scouts for a beach at Chalk Hill.

3. In 1941 Wisconsin-Michigan Power Company placed the Michigamme Reservoir in operation to impound high flows during high runoff periods for use at other times when low-flow conditions prevail. The effect of this has been to substantially increase minimum flows and to reduce the frequency of low periods. On Pages 16 and 17 in the report, reference is made to drought flows as determined from a book entitled "Drought Flow of Michigan Streams, in which the effect of the reservoir was not taken into account in using data for periods prior to 1941. Therefore, a considerable misrepresentation has been introduced into the drought flow values stated in the report as applied to the present conditions.

That is all of my statement, Mr. Chairman.

MR. STEIN: Thank you very much.

Are there any comments or questions?

(No response.)

MR. STEIN: That is very helpful. Thank you.

MR. RAFFIN: Thank you, sir.

MR. STEIN: Mr. Oeming?

MR. OEMING: Chairman Stein, I would now like to introduce to you Dr. Garland who is going to present a statement on behalf of the Forum on Resources of Upper Michigan.

STATEMENT OF DR. H. GARLAND ON BEHALF OF FORUM ON RESOURCES OF UPPER MICHIGAN

DR. GARLAND: Mr. Chairman, members of the conference, ladies and gentlemen:

My name is Hereford Garland. I am Director of Forest Products Research at Michigan College of Mining and Technology.

Today I am acting as Vice Chairman of the Forum On Resources Of Upper Michigan.

Its letterhead gives a sentence describing this organization as "A Study Group, representing Qualified Organizations and Individuals Interested in the Economic Advancement of the Upper Peninsula of Michigan through Multiple Use of its Resources."

"October 29, 1963

"Mr. Murray Stein, Chairman
Menominee River Conference

"U. S. Public Health Service

Department of Health, Education, and Welfare

"STATEMENT BY FORUM ON RESOURCES OF UPPER MICHIGAN:

"FORUM is dedicated to the wise use of the resources of Upper Michigan in the interests of the public at large, the residents of the area and the resource owners.

"FORUM believes in the multiple use of water as well as other resources. It is concerned that the Conference respect the uses of the Menominee and Brule Rivers for waste disposal that has made possible the economics of the communities on the streams through mineral and wood industries.

"Control of pollution has been exercised by the Michigan Water Resources Commission and other state agencies and FORUM has confidence in the wise use of the waters under these controls.

"Pollution is a relative term describing many varied conditions and the legal definition of the term set up by the State of Michigan has been enforced by the state's agencies charged with this responsibility. To inject new criteria and "standards of water quality could be so disruptive to the economy of the area that it would be ruinous. Any such changes should, for the orderly accomplishment of public interest and the preservation of the economy, be worked through the state agencies most conversant with all the factors involved in this complex.

"FORUM believes that recreation should have its interests in the waters respected and protected, but in the context of multiple use, it believes that this end is being served, as evidenced by the improved quality of the streams under the present control systems.

"Respectfully submitted,

FORUM

By Joseph P. Rahilly, Chairman."

MR. STEIN: Thank you, sir.

Are there any comments or questions?

(No response.)

MR. STEIN: If not, thank you very much for your statement.

MR. OEMING: Mr. Chairman, I have an indication by the Marathon Division of the American Can Company that they wish to make a statement.

Is Mr. Orr in the audience, or anyone from Marathon?

MR. ORR: My name is Thomas Orr, Mr. Oeming, but we have no statement. I am sorry.

MR. OEMING: Thank you.

Mr. Chairman, I also have a letter from the Delta County Sportmen's Club, transmitting a statement, and it is signed by Victor H. Powers, Secretary.

Is Mr. Powers in the audience?

(No response.)

MR. OEMING: If not, Mr. Chairman, may I read the statement?

MR. STEIN: Certainly.

MR. OEMING: Thank you.

"DELTA COUNTY SPORTMEN'S CLUB
ESCANABA, MICHIGAN

612 S. 12th Street
November 2, 1963

"Loring F. Oeming, Executive Secretary
Michigan Water Resources Commission
200 Mill Street, Station
Lansing, Michigan

"Dear Mr. Oeming:

"Enclosed is a copy of the letter I am sending to Mr. Murray Stein on the Menominee River Conference on Nov. 6.

"Although we are rather mystified over this conference, because of lack of knowledge as to why it was called, the members want a letter sent.

"I believe the letter captures the thinking of two sessions at which the matter was discussed -- extremely vague.

"Sincerely

/s/ Victor H. Powers, Sec."

* * *

"612 S. 12th Street
November 2, 1963

"Mr. Murray Stein, Chairman,
Menominee River Conference,
Goodfellowship Hall,
Menominee, Michigan

"Dear Sir:

"Our group obviously has an interest in clean waters. Our inquiries in pursuit of knowledge about the welfare of the fish we love to try to catch has led to an appreciation of the importance of clean water to human health "and enjoyment.

"We hope that your conference will be a help in the abatement of all pollution of our waters. In your survey of the industrial and municipal pollution we can only hope that attention will be given to the insecticides and herbicides that must run off the land, on which they are doused, into the water.

"We are pleased with the progress which has been made in the waters with which we are familiar and wish you success in your efforts because any advance anywhere can but make it easier to achieve betterment in our home waters.

"Sincerely,

/s/ Victor H. Powers, Sec."

* * *

I also have a written statement presented on behalf of the Michigan United Conservation Clubs by Mr. James L. Rouman, the secretary, and he indicates that if he cannot be here, someone would be here to present the statement.

Is anyone here delegated to present this statement?

(No response.)

MR. OEMING: If not, Mr. Chairman, I should like to read this.

MR. STEIN: Yes.

MR. OEMING: Thank you.

"My name is James L. Rouman of Lansing, Michigan. I am executive director of Michigan United Conservation Clubs, a statewide, non-profit conservation organization of nearly 350 affiliate clubs and 60,000 members.

"For many years, MUCC has been concerned with water resources management and the pollution of our lakes and streams. MUCC was, in fact, instrumental in the formation of the Michigan Water Resources Commission. We are proud of our record of activity in this field, and are anxious to continue working with any agency, state or federal, in the prevention and elimination of pollution and the improvement of our water resources.

"Preceding the Detroit River Pollution Conference held in March, 1962, representatives of state and federal agencies involved, along with representatives from MUCC, met in then-Governor Swainson's office and discussed the matter. Following this, the federal government was requested to enter the picture, set up a conference and aid in combating the pollution.

"This was done to the satisfaction of all concerned.

"Several months ago, the U. S. Department of Health, Education and Welfare announced that an enforcement conference on pollution in the Menominee River would be held here at Menominee Nov. 6. It was called under provisions of the Federal Water Pollution Control Act, which allows the HEW Department to call for action whenever it believes that pollution in interstate waters is endangering the health and welfare of persons in a state other than the one in which the pollution originates.

"Neither the water resources officials of Michigan nor of Wisconsin were consulted or alerted prior to this action. Although both states were in touch with the situation, neither was aware of a pollution problem causing danger or injury to the other.

"The Michigan Water Resources Commission wrote to the HEW Department asking what the problem was supposed to be and why the conference was called. MUCC also wrote to the Department for information.

"Months passed. The Water Resources Commission, "we understand, finally received some information a few days ago, on Oct. 31. MUCC, a leader in the fight against pollution of Michigan waters, never did receive the information.

"We regret that it was impossible for MUCC to obtain this information to pass on to its 60,000 members.

"We should like to know just what the serious problem is which demanded federal intervention, and why we were unable to receive information on this from the federal agency involved.

"Michigan -- and MUCC -- is presently involved in a difficult constitutional reorganization of all its state agencies. We fear that action of this kind by the federal government is apt to hinder or jeopardize our efforts to maintain the Water Resources Commission as a strong, policy-making body.

"We would also like to point out that MUCC, as an organization of sportsmen, is vitally concerned with the recreational aspects of water use. While subscribing to the principle of multiple use of resources and recognizing the problems of industry and municipalities, we firmly "hold that water must be preserved in a state suitable to sustain fish and wildlife, and suitable to provide pleasure for the fisherman, the hunter, the boater and the sightseer.

"To this end we will support all efforts to preserve our water resources in Michigan, the 'Water Wonderland.'"

* * *

MR. STEIN: Thank you, Mr. Oeming.

There is at least one point I think we should comment on, which I think is well known, and I would like to state, namely, the policy of our Department and I think all the other water agencies in the Federal Government. We certainly have no desire, nor do I see that any operation of our Federal law in any way, manner or means should deal with the internal organization of how you set up your departments in the State of Michigan. This is not our concern.

As far as I know, this is not a proper area of Federal concern, and we certainly have not taken a position on that, by implication or otherwise.

I also do understand that this report was supplied in accordance with our usual practice about a month before the conference.

MR. OEMING: Yes, sir. It was received

September 30th.

MR. STEIN: September 30th, and this has been the usual practice, either to send these out at the calling, when the Secretary announces the calling of a conference; or if the Secretary announces the calling of a conference without sending the reports, to get these out a month before the conference, so that everyone is informed of this.

Generally speaking again, these reports, as you can tell, are technical reports made available to the official agencies and other people who ask for them. They are not made for general distribution.

As a matter of fact, in this report there have been a few changes, some changes suggested by Michigan, which were accepted.

I think in all the reports put out here, in the broad technical reports, there are minor changes made by all parties, in the reports. For that reason, I think none of these reports should in any way be given wide distribution beforehand.

Would you continue, Mr. Oeming?

MR. OEMING: Yes, sir. I have one more statement of intent to present a statement at this conference. It is from Mr. Dughie, General Manager of the Scott Paper Company. I am not sure whether Mr. Dughie has completed his statement insofar as their Michigan mill is concerned, so I would like to give him this opportunity if he wishes to.

MR. DUGHIE: I have no further comments, sir.

MR. OEMING: Thank you.

Those are all of the requests for the presentation of statements I have, Mr. Chairman. I have several letters indicating intent to be present at this conference, but not to give a statement.

MR. STEIN: Thank you very much, Mr. Oeming.

MR. OEMING: I think we can resume.

MR. STEIN: I think you can resume. I think what we are going to do is pick up tomorrow for the completion of this, and we are going to try to get as many participants in for Michigan in order for them to meet their commitments, as we can.

MR. OEMING: I neglected to ask whether there are any other people from Michigan who wish to be heard at this time, and I would like to ask for this opportunity.

MR. STEIN: Yes, sir.

MR. OEMING: I see none, so I would ask, Mr. Chairman, to resume the presentation of the State's report, and give us as much time as you can. It is four-thirty now approximately, and perhaps in 45 minutes we might get through quite a little of this.

MR. STEIN: We will continue.

MR. OEMING: Mr. Chairman, in order to accommodate our travel arrangements, I would like to go out of order a little bit here in the State's presentation and at this time call on William Marks of our office to present a report that he has. It is not contained in the bound report.

MR. STEIN: Thank you.

STATEMENT OF WILLIAM MARKS, WATER CONSERVATIONIST, MICHIGAN WATER RESOURCES COMMISSION

MR. MARKS: Mr. Chairman, conferees and ladies and gentlemen:

I would like to ask that this be entered as part of the record.

MR. STEIN: It will be entered.

MR. MARKS: Thank you.

COMMERCIAL FISHING IN THE MICHIGAN WATERS OF GREEN BAY

Green Bay, the largest embayment of Lake Michigan (1,700 square miles), has traditionally been a prime producer of commercial fish. The bay is shallow, with a maximum depth of 20 fathoms, and relatively open with two major bays, Big and Little Bay De Noc, in the north and the deep Green Bay proper in the south.

Over a score of ports have been fishing centers through the years. Commercial fishing in Green Bay began well over 100 years ago. The following is a description of fishing on Green Bay from an early account. (George Brown Goode, The Fisheries and Fishery Industries of the United States, Section 11. A Geographical Review of the Fisheries Industries and Fishing Communities for the Year 1880, p. 639-646. U. S. Government Printing Office, 1887.)

In 1879, at Escanaba, there were 92 men employed in the pound, gill and seine fishery. The grounds fished, were almost the whole northern portion of Green Bay and around Washington and Saint Martin's Island. Three hundred thousand pounds of fresh fish (mostly whitefish and trout) and ,300 half-barrels of salt fish were processed at Escanaba in that year.

Between Cedar River and Peshtego Point some 30 families were engaged in fishing, using mostly pound nets in the summer and gill nets through the ice in winter.

From Peshtego to Little Tail Points about 50 families and 65 unmarried men were dependent on fishing. Pound net fishing was the most important (30 operators) with the remainder using gill nets and haul seines. Six hundred thousand pounds of fresh fish and 17,000 half barrels were produced in 1879 from this area.

At Green Bay there were 25 full-time fishermen and 75 or 100 seasonal (spring) "semi-professionals."

The east shore of Green Bay had already suffered a marked decline by this time (1879), there being only one-fourth of the investment in gear that there had been a decade before.

Toward the end of the last century, fairly complete records became available for Green Bay. By that time lake herring dominated the catch. Whitefish did not assume a prominent place in terms of total pounds in the decades just before and after the turn of the century in Green Bay.

The foregoing gives some indication of the Green Bay fishery in the 19th century. The following 50 years saw fishing on Lake Michigan and Green Bay not greatly changed. Steam tugs came into general use and were in turn replaced by gas or diesel vessels.

Trout were commonly fished with hooks on the Wisconsin shore of Lake Michigan. Most of western Michigan south of Grand Traverse Bay, was fished with gill nets. This gear was commonly used on the Wisconsin shore south of Green Bay. In the bay itself and in other areas of the northern lake, pound and trap nets were widely used.

While catch data for Lake Michigan are readily available for most of this period, specific data for Green

Bay are not. However, from early records and those of the more recent catch, it is evident that not all kinds of fish were taken in volume in Green Bay -- this primarily because of depth.

Lake trout have not been significant in the Green Bay catch. The 21 year average, 1929-1949, of trout taken in Michigan waters of Green Bay was 126,000 pounds. The comparable figure for Lake Michigan is nearly 5 million pounds. (Commercial Fish Production in the Great Lakes 1867-1960. Great Lakes Fish Commission Technical Report No. 3, p.118. July 1962.) Chubs have generally not been taken inside Green Bay.

Certain other fish -- perch, walleye and carp have been taken almost exclusively from Green Bay (in Lake Michigan) and the principal fishing grounds for lake herring and smelt were (are?) in Green Bay. Whitefish and suckers were important both in the bay and on the lake.

There are complete catch statistics available for the Michigan waters of Green Bay since 1929 (Fluctuations in the Fisheries of State of Michigan Waters of Green Bay. Fishery Bulletin 75. U. S. Fish and Wildlife Service, 1953.), and for Wisconsin waters for more recent years. This period spans a time of great change in the fishery in Green Bay. It includes periods of high production in the late 1920's and early 1930's and in the late 1940's and early 1950's. It also includes the very low harvest in the middle and late 1930's and the almost complete collapse of commercial fishing in recent years.

Following is a brief description of the production and composition of the fish landed at the Michigan ports on Green Bay for 1934, 1938, 1941 and 1944-1962. These data were obtained from the Fish Division of the Michigan Department of Conservation.

Menominee: During these 22 years, the largest annual catch (1948) was three-fourths of a million pounds. The principal fisheries at Menominee have been lake herring (more than 40% 1947-53) and smelt (more than 35% since 194[illegible] -- over 90% in 1958). The herring catch has fluctuated widely through the years (9,166 pounds in 1944 to 529,930 pounds in 1948) but in the past decade it has declined steadily from 205,950 pounds in 1952 to 661 pounds in 1962. Smelt production has been fairly stable generally over 100,000 pounds annually since the recovery from severe mortality of the early 40's.

No other species have been particularly significant in the landings at Menominee with the exception of whitefish in 1947 and 1948, and alewife in 1959 and 1960. Even in the peak years, walleye production was under 10,000 pounds.

The greatest landing of perch was 20,082 pounds in 1960. Carp, chubs, suckers and trout have not been particularly significant.

Ingallston: Catches of over 1,000,000 pounds have been frequent -- 12 out of the 22 years -- the composition has been almost entirely herring and smelt except in 1947-1948, when 196,000 and 228,000 pounds of whitefish were landed.

Cedar River: The composition of the fish landing at Cedar River is almost identical with that of Menominee and Ingallston. Herring and smelt have comprised most of the catch, except in 1947 and 1948, when whitefish totalled 17.5 and 25.1% respectively. Herring led in production from 1944 through 1950 and smelt from 1951 through 1959. Since 1960 the alewife has made up over 74%.

Ford River (Bark River): The landings at Ford River have ranged widely -- over 300,000 pounds in 1938, none in 1944, 7,141 in 1948, and 233,839 pounds in 1957. Five species -- herring, suckers, walleye, smelt and perch -- have all led in production in at least one of the 22 years herein discussed. The combined catch from 1960 to 1963 was less than 70,000 pounds.

Escanaba: This is the most important fishing port on Green Bay. From 1950 to 1958, the annual landings at Escanaba were in excess of 2,000,000 pounds, with peak years in 1955-56, reaching over 3 million pounds. This was approximately ten percent of the total Lake Michigan catch for those years. From a percentage standpoint, herring and smelt made up the bulk of the catch. However, in dealing with such a large volume of fish, even a relatively small percentage can be significant. The 231,644 pounds of walleye landed in 1951 was only 11.3 percent of the Escanaba total for that year but it was 41% of the Lake Michigan walleye take. Thirty-seven percent of the 7.7 million pounds of walleye taken in Lake Michigan from 1947-1960 were landed at Escanaba. In the past decade smelt have constituted over half of the Escanaba total. Whitefish landed at Escanaba were important in 1947 and 1948 -- 40% and 20% of the total respectively. Prior to 1952, suckers made up at least 10% of the port's total. In the year 1960, 7% of the 1,094,295 pound total was suckers. In the past three years (1960-62) perch have become an increasingly important part of the catch -- 22%, 38.5% and 43.4%. The 1962 landing at Escanaba was 586,527 pounds, 50% of which were smelt; perch constituting most of the remaining 50%.

Gladstone: The landings at Gladstone have ranged from a low of 89,684 pounds in 1945 to a high of 617,749 pounds in 1958. From 1941 to 1951, suckers and walleyes constituted most of the catch. Since then, smelt have accounted for most of the catch. Walleyes made up 16% in 1956, but in the rest of the period were lower. In very recent years, perch have become more important, 32% in 1961.

Rapid River: As a fishing port, Rapid River has not been important, less than 10,000 pounds a year since 1950 (none in some years). Suckers have made up the largest percentage of fish landed at Rapid River.

Ensign: The bulk of the composition of commercial fish landings have been suckers and walleye. The total take has ranged from 205,700 pounds in 1950 down to 22,000 pounds in 1962.

Stonington: The yearly landings at Stonington have been less than 100,000 pounds and mostly less than 50,000 pounds, with only 1,451 pounds in 1962. In late years, smelt have been most important.

Nahma: The 14,724 pounds of fish landed in 1962 is by far the smallest volume of fish at Nahma in many years, 1949 was the peak year when 299,000 pounds were landed. Suckers, walleyes and perch in that order have constituted the bulk of catch at Nahma. Over 124,000 pounds of walleye taken were out of Nahma in 1949.

Garden: Garden is the most important fishing port on Big Bay De Noc. The landings have been mostly above

200,000 pounds per year. The catch composition at Garden is varied, perch, suckers, whitefish and walleye have constituted the bulk. In an occasional year, herring and smelt in sizeable numbers have been caught. Whitefish, important prior to 1954, were virtually missing from the catch from 1955-60, but in 1962, again made up 23% of that year's rather small total -- 109,662 pounds. Recent landings (1963) of whitefish at Garden have been caught outside of Green Bay. Walleyes during their peak years, amounted to over 40% of the total; 235,129 pounds in 1955. In the last three years of record, 1960-62, perch landings were in excess of 50% of the total.

Fayette: In September of 1963, there were no active fishermen working from this once important port. Catches of one-half million pounds or more were landed at Fayette from 1948 through 1956. With the end of the herring run in 1957 and of whitefish in 1954, the importance of this port has steadily declined. Only 15,838 pounds were landed in 1962.

Certain other ports (or sections of coast line) have been sites of commercial fish landings, such places as Arthur Bay, Masonville, and Isabella. None were particularly significant, however.

Wisconsin fishermen, licensed to fish in Michigan waters, report their Michigan catches to the Michigan Department of Conservation even when landing in Wisconsin ports. Marinette and Washington Island are the principal Wisconsin ports in Green Bay for fishermen using Michigan waters.

Marinette in the last few years has not been significant; only 1,413 pounds were landed in 1962. During the late 1940's and early 1950's, large numbers of herring were brought into Marinette; 701,308 pounds in 1948. Smelt in substantial numbers were landed from 1947 through 1954.

Washington Island has been an important center of fish production. Over 1,700,000 pounds of whitefish were landed there from 1947 to 1950 and 3,220,000 pounds of herring from 1951 to 1956. Chubs (from Lake Michigan) have also been important. With the decline of herring and whitefish, the landings have dropped to less than 150,000 pounds a year in the last three years, 1960 through 1962.

Fish production in Wisconsin waters of Green Bay since 1949 has closely paralleled that of both Michigan Green Bay and for some species that of Lake Michigan. Southern Green Bay in some respects is unique in its production. For example, almost all the carp in Lake Michigan are taken there, as are substantial numbers of perch -- 1,373,000 pounds in 1955 compared to 411,000 pounds for Michigan's

Green Bay. Very large numbers of herring have been taken in Wisconsin waters of Green Bay, but here, too, there has been a steady decline in recent years. In 1950, a peak year for lake herring in Green Bay, there were landings of 3,801,687 pounds in Wisconsin and 2,642,913 pounds at Michigan ports.

Whitefish, at least in recent years, have not been as significant in southern Green Bay as in the north. In 1949 (the highest production year 1949-63), the take in Wisconsin waters was 363,241 pounds as compared to 1,478,029 pounds in Michigan -- Escanaba alone landed over 280,000 pounds that year.

Walleye production in Green Bay is limited almost exclusively to northern Green Bay. Only 50,691 pounds were taken in the southern bay while over 1,200,000 pounds were caught in the north, 701,507 pounds were landed at Excanaba.

Smelt landings were over four times greater in Michigan waters than in Wisconsin 1958 (the peak year for Wisconsin in 1949-62) -- 1,426,880 pounds to 5,820,142 pounds.

Suckers production has been important particularly in southern Green Bay and Big and Little Bay De Noc.

The foregoing discussion of the commercial fish harvest from Green Bay gives an indication of the relative importance of the respective Michigan ports and areas of harvest in the Bay. The accompanying map gives an approximation summary of this information. Figure 1 shows the relative rank of the major ports on Green Bay.

Figure 2 is an evaluation of the total havest from 1930 to 1962 and of the composition of that harvest. What the change in composition and decline in harvest has meant to the fisherman is not readily apparent.

Excellent data on number of licenses issued, types of gear used and numbers of men employed in addition to license holders are available. Unfortunately, transcribing it into anything but a measure of fishing intensity and efficiency of gear is extremely difficult.

Commercial fishing on the Great Lakes has been a source of supplemental employment since the beginning of the industry. Fish are not uniformly distributed either in time or place throughout the year. Most species are concentrated by only their feeding habits or spawning activities. Because of this, fishing is at its peak during spring and fall months. During slack seasons, then, part-time fishermen, and the extra help needed during 'the runs,' must seek employment elsewhere. Many license holders fish only in winter, through the ice -- a very common practice on Green Bay -- others fish weekends, or combine it with farming activities. In the last century, these comments would have been equally applicable.

The number of licenses and men employed is, of course, a measure of fishing employment and can be compared with production to gain some understanding of the relationship between production and employment. In 1950 there were 379 licenses issued for Michigan waters of Green Bay and an additional 566 men employed. Comparable figures for 1962 were 136 licenses and 95 additional men employed. In 1963 there were 104 commercial fishing licenses issued for the Michigan waters of Green Bay. In September 1963, only about one-third of these licenses were in use.

The total value of the Michigan Green Bay catch in 1962 was $149,127.95 -- something like $646 per man employed. This is nearly a 30 percent decline from 1950, when the catch was worth $854,176 and there were 945 fishermen and employees -- $902 per man.

Fishing on Green Bay and the rest of the Great Lakes developed when the resource base was adequate and of high quality. The early industry was also stimulated by an active market. These conditions are not operative today.

It is difficult to gain a clear understanding of the abundance of fish in the Great Lakes in the early years. An inescapable conclusion, however, is that it was much greater then than even in the closing decades of the last century. It seems evident that even before the total number of fish declined there was a marked decrease in the size of fish taken. Early literature is unanimous in deploring the decline in fish populations. The total catch of whitefish on Lake Michigan in 1879 was 12,030,000 pounds. Never again was even half of this total taken in a single year.

In 1860, one fisherman fishing in Bay De Noc with two small pound nets (18 and 20 feet deep and 28 x 32 feet square) took 175,000 pounds of whitefish in 45 days. (George Brown Goode, The Fisheries and Fishery Industries of the United States, Section II. A Geographical Review of the Fisheries Industries and Fishing Communities for the Year 1880, p. 644. U. S. Government Printing Office. 1887.)

Three thousand nets were lost because of storms in a single fall from the entrance of Green Bay, carrying 500,000 to 600,000 whitefish with them.

There were 6.5 million-plus pounds of perch taken in 1894. Since 1900, the annual take has not exceeded 3.6 million pounds.

Nearly 4 million pounds of sturgeon were caught in 1879. After 1900 the annual catch never reached 100,000 pounds. There have been exceptions, of course -- notably in the walleye and some non-native species.

The reasons for the decline are highly complex. Some causes are well known, e.g., the sea lamprey, but others are not. The role that non-native species have had on the lakes' fish populations is not fully understood. Total production on the lakes has remained relatively high but the catch composition has changed drastically over the years and the introduced species have become increasingly important in the total poundage harvested.

Man and his activities have done most to change the commercial fishery. Fishing itself has probably been most significant. Very early, because of over-fishing, some species became unimportant -- sturgeon, northern pike and black bass. It has also been suggested that the larger species of chubs and the Lake Erie cisco were greatly reduced by heavy fishing pressure.

Aside from fishing, and perhaps in the long run most important, has been man's role in changing the Great Lakes' environment. The Great Lakes, as they now exist, are a very recent geologic feature -- only three to four thousand years old. Not only are the lakes recent, but so is the setting in which they occur. Aside from northern and western Lake Superior and northern Lake Huron, most of the drainage basin is composed of glacial debris, unconsolidated drift, and lacustrine clays -- a vast area which in its original condition was characterized by immature drainage and virtually a complete forest cover.

In only one half-century (1830-1880) the changes brought about in the Great Lakes basin were very profound. The southern half went almost completely into agriculture, the northern half was mostly logged off, millions of acres were artificially drained, canals and waterways dredged. What the combined effects of this tremendous change was on the Great Lakes waters is not known, but it was considerable. During this same era, great industrial cities rose along the lakes -- Detroit, Chicago, Gary, Cleveland, Buffalo, Toronto -- and all used lake water for municipal and industrial waste assimilation further changing the lake environment, further enriching it.

Perhaps the most destructive of lake fish habitat in immediate effect was the dumping of sawdust of timber sawed from many thousands of square miles into a few restricted but, in many cases, highly productive areas -- Saginaw Bay, Thunder Bay, the West Michigan lake ports, Green Bay. This sawdust and other mill refuse accumulated to many feet on the bottom locally. It is reported as "floating in a mass from a quarter of a mile to two miles broad and many miles long, floating about in the bay" (Green Bay). (Ibid., p. 641.)

Other changes too, have been influential in changing the lake environment and consequently the fish populations.

Beach erosion, a natural process, goes on virtually unchecked, contributing millions of tons of oxygen-demanding sediment to the lake bottom. Beach erosion that was of the magnitude that accounted for 450 feet of shore recession of a 20-foot bluff in 75 years (14 miles north of Port Huron). (Leon J. Cole, The Delta of the St. Clair River, Geological Survey of Michigan, p. 9, 1903.) Beach erosion that contributed the bulk of the material that built the St. Clair Delta within the time of recorded history.

There are many other factors to be considered, such as agricultural fertilization, natural and cultural enrichment, and great storms.

The decline of the Green Bay fishery (and the Great Lakes in general) has resulted from two main causes -- the failing of the basic supply of marketable fish, and a distinctly limited demand for fresh water fish.

Thank you.

(Figures 1 and 2, and Map No. 1, attached to the preceding statement, are as follows:)

FIGURE I.

TOTAL CATCH
MAIN MICHIGAN PORTS ON GREEN BAY

PERIOD 1944-1962

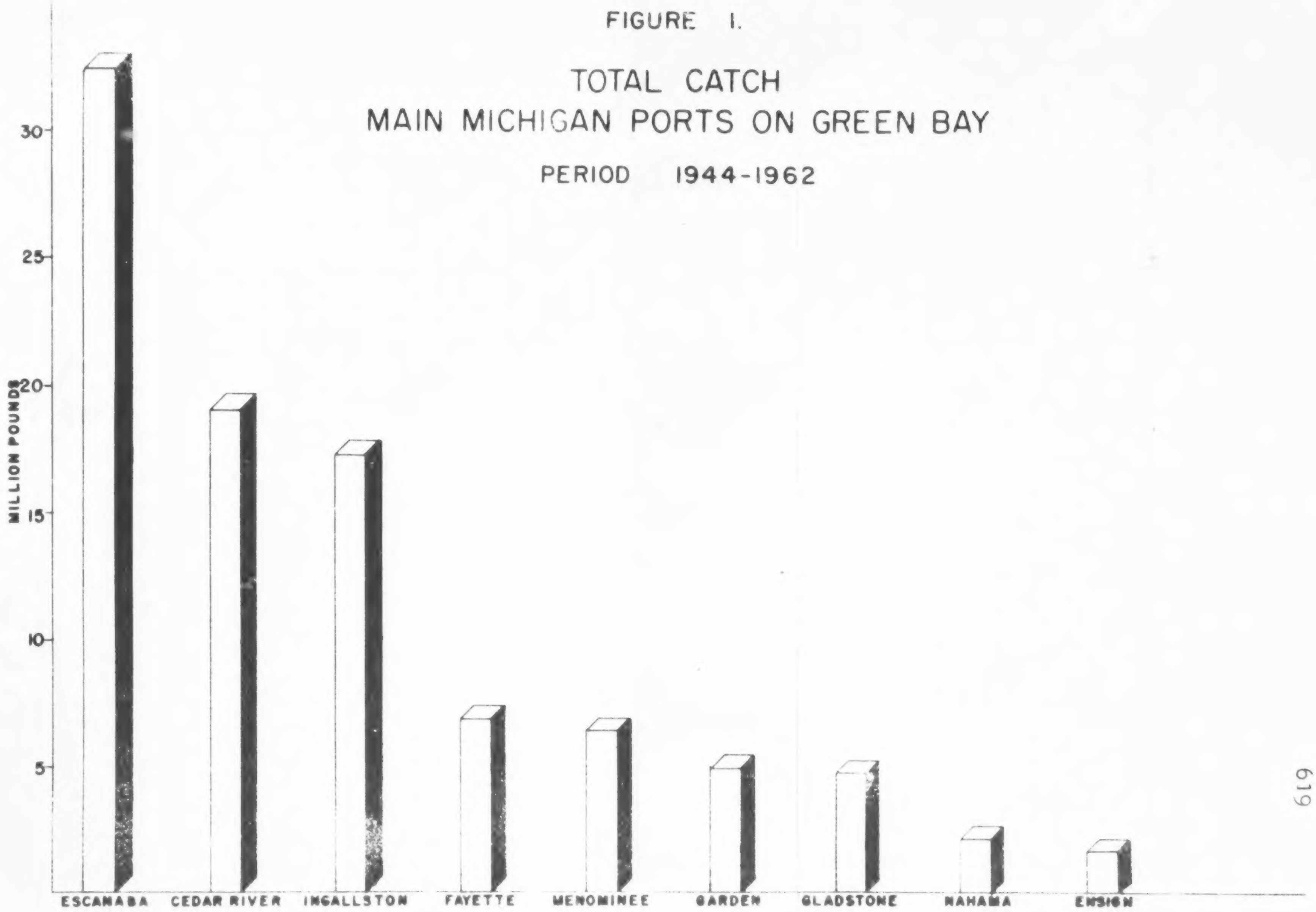
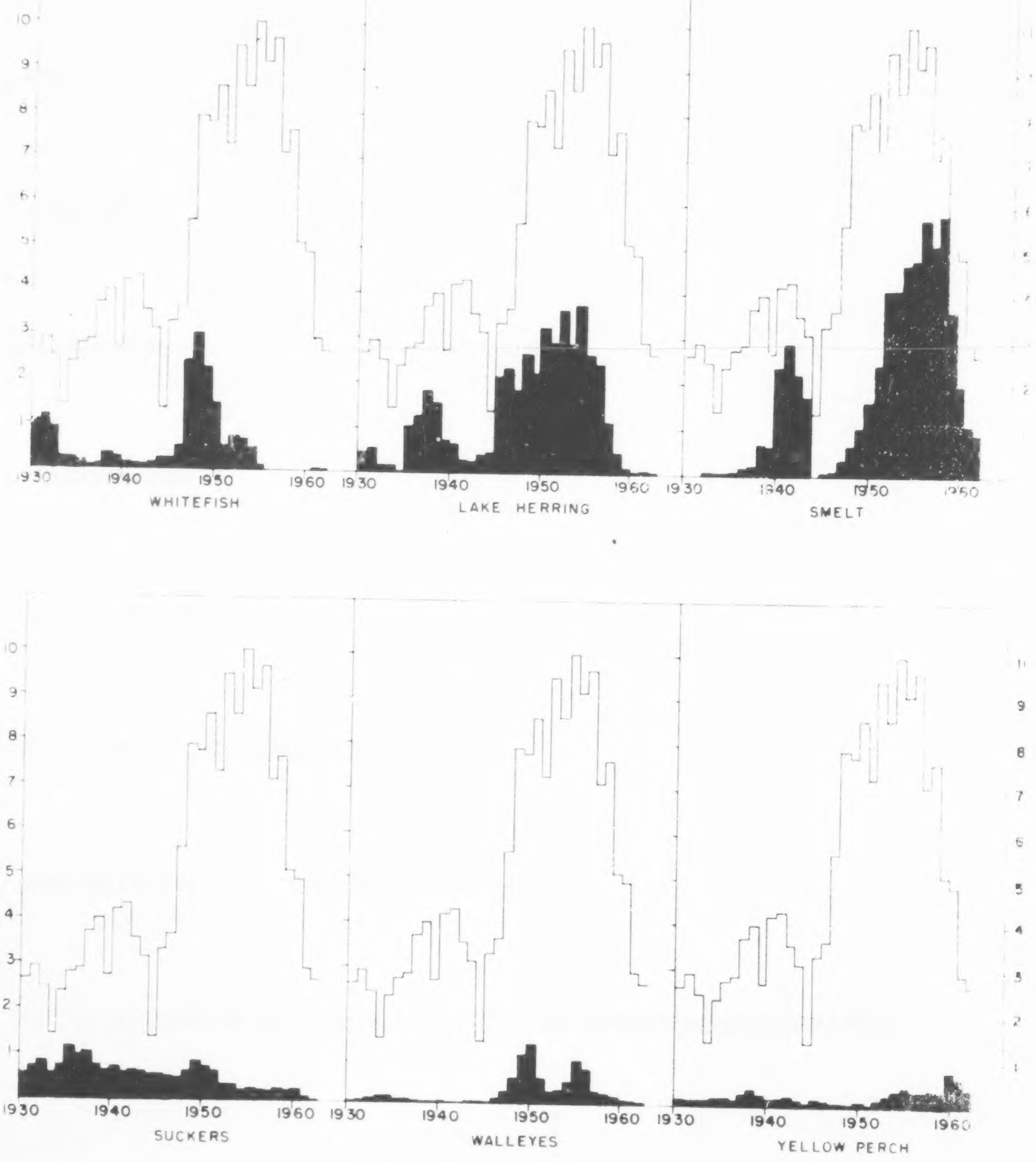
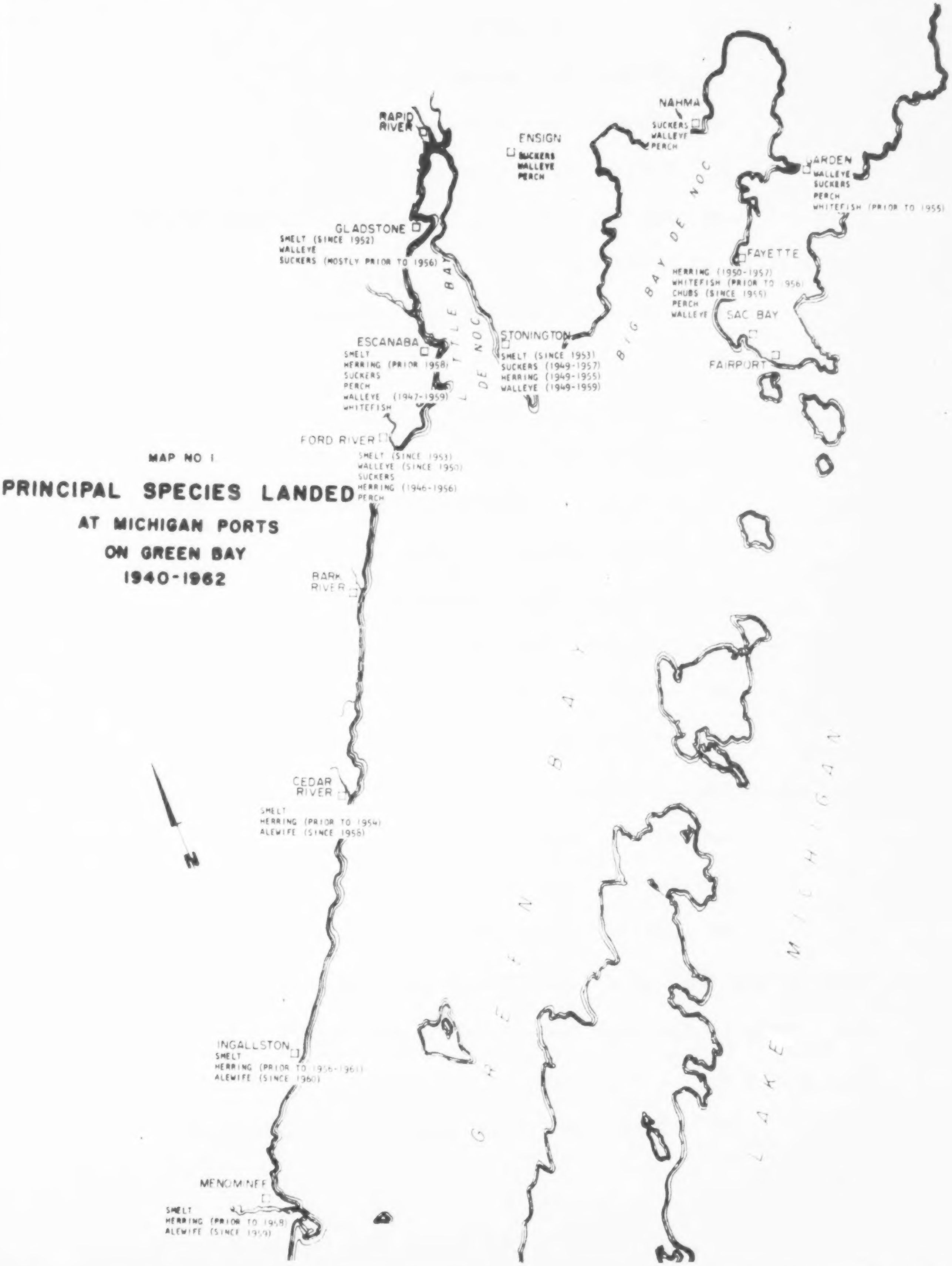


FIGURE 2

TOTAL HARVEST and COMPOSITION of COMMERCIAL FISH HARVEST

FROM THE GREEN BAY WATERS OF THE STATE OF MICHIGAN
1930-1962
In Millions of Pounds





MAP NO 1

PRINCIPAL SPECIES LANDED
AT MICHIGAN PORTS
ON GREEN BAY
1940-1962

RAPID RIVER
ENSIGN
SUCKERS
WALLEYE
PERCH
NAHMA
SUCKERS
WALLEYE
PERCH
GARDEN
WALLEYE
SUCKERS
PERCH
WHITEFISH (PRIOR TO 1955)
GLADSTONE
SMELT (SINCE 1952)
WALLEYE
SUCKERS (MOSTLY PRIOR TO 1956)
FAYETTE
HERRING (1950-1957)
WHITEFISH (PRIOR TO 1956)
CHUBS (SINCE 1955)
PERCH
WALLEYE
SAC BAY
LITTLE BAY DE NOC
BIG BAY DE NOC
STONINGTON
SMELT (SINCE 1953)
SUCKERS (1949-1957)
HERRING (1949-1955)
WALLEYE (1949-1959)
ESCANABA
SMELT
HERRING (PRIOR 1958)
SUCKERS
PERCH
WALLEYE (1947-1959)
WHITEFISH
FAIRPORT
FORD RIVER
SMELT (SINCE 1953)
WALLEYE (SINCE 1950)
SUCKERS
HERRING (1946-1956)
PERCH
BARK RIVER
CEDAR RIVER
SMELT
HERRING (PRIOR TO 1954)
ALEWIFE (SINCE 1956)
N
GREEN BAY
LAKE MICHIGAN
INGALLSTON
SMELT
HERRING (PRIOR TO 1956-1961)
ALEWIFE (SINCE 1960)
MENOMINEE
SMELT
HERRING (PRIOR TO 1958)
ALEWIFE (SINCE 1959)

MR. STEIN: Mr. Muegge?

MR. MUEGGE: May I ask a question?

MR. STEIN: Yes, surely.

MR. MUEGGE: On Page 2 you said, "on the Wisconsin shore south of Green Bay."

Is that Green Bay City?

MR. MARKS: Yes.

MR. MUEGGE: Is that the river?

MR. MARKS: Oh, I see.

MR. MUEGGE: It should be north of Green Bay.

MR. MARKS: North of Green Bay.

MR. MUEGGE: Then I would like an added explanation. What is the carp used for?

MR. MARKS: It is used primarily for animal food.

MR. STEIN: You said presumably commercial fishing is done through the ice?

MR. MARKS: Yes, sir.

MR. STEIN: How do they do that?

MR. MARKS: These are gill nets, and they cut a hole in the ice and a lead line draws a gill net under the ice. Many people that don't fish in the summer, fish because they don't need a boat then. They are all licensed to fish.

MR. STEIN: Are there any other comments or questions?

(No response.)

MR. STEIN: If not, thank you very much.

MR. OEMING: Now, Mr. Chairman, I would like to resume with Mr. Purdy on industrial waste treatment and control.

MR. STEIN: All right.

FURTHER STATEMENT OF RALPH W. PURDY, CHIEF ENGINEER, MICHIGAN WATER RESOURCES COMMISSION

MR. PURDY: Thank you.

INDUSTRIAL WASTE TREATMENT CONTROL

Michigan industries discharging wastes separately to watercourses through company-owned sewers have a direct obligation to the Water Resources Commission to comply with the provisions of the Water Resources Commission Act.

The Commission through its Upper Peninsula District Engineer, located in a district office at Escanaba established in November of 1949, maintains routine surveillance of all facilities for industrial waste control in the Michigan portion of the Basin. The Lansing staff of the Commission augments the Escanaba office at such time as it is needed.

R. W. Purdy

The Michigan Water Resources Commission through its staff has developed and issues an annual industrial pollution status report. All industries discharging wastes directly to the waters of the State are listed and each is assigned a rating on the degree of control maintained during the preceding year. The degree of control is evaluated in relation to the statutory test of unlawful pollution as defined in the Water Resources Commission Act (Act 245, P.A. 1929, as amended by Act 117, P.A. 1949 and Act 165, P.A. 1963). Each industry rated receives a copy of the status report, providing a continuing record by which accomplishments can be measured.

There are nine industrial sources of wastes in Michigan which utilize the surface waters in the Menominee-Brule River Basins for disposal. All of these industries maintain facilities for waste control. The sources are identified below, including a description and evaluation of the type of waste, actions taken by the Commission and the current waste control rating assigned to each. Additional specific information for each industry is shown in Appendix C

IRON RIVER

HANNA MINING COMPANY

The Hanna Mining Company, located in Iron River, operates two mines in the district.

Homer-Wauseca Mine

The Homer-Wauseca Mine is located in the City of Iron River. Waste discharges consist of accumulated underground water (pH 6.8) which is pumped to a surface settling pond. Pond effluent is discharged to Sunset Creek in Section 22, T. 43 N. R. 35 W. Shower water from employee change houses is discharged to the pond with the mine water. Sanitary sewage is pumped into the Iron River municipal system. The company also pumps ground water from several wells in the glacial drift to Sunset Creek and the Iron River.

In 1962 dewatering of the old Homer-Cardiff mines, to protect the new Homer-Wauseca working to the south, created a problem in the Iron and Brule Rivers associated with precipitation of the dissolved iron from the acid mine water after mixing with the river water. Pumping from the Homer-Cardiff mines ceased February 1, 1963, after the development of wells in the glacial drift immediately overlying the ore-body of the Homer-Wauseca Mine.

With the exception of 1962, control of wastes has always been rated as adequate.

Hiawatha Mine

The Hiawatha Mine, which consists of two mine shafts, interconnected underground, is located in the City of Stambaugh. Underground water (pH 6.2) in the upper levels of the mine is intercepted and pumped intermittently at 200 gpm to the surface at the Hiawatha No. 1 shaft from where it flows to the Iron River. Acid mine water (pH 3.1) from below the fifth level of operations is collected and pumped intermittently at 150 gpm, to the surface to two settling ponds at the Hiawatha No. 2 shaft. Pond effluent is discharged to the Iron River. Shower water from employee change houses is discharged to the ponds with the underground mine water. Sanitary sewage is collected separately and disposed of through a septic tank system with subsurface percolation of the effluent. The need for additional control of these wastes to protect against unlawful pollution has not been established.

INLAND STEEL COMPANY

Sherwood Mine

The Sherwood Mine is located in the Village of Mineral Hills; 200 gpm of acid (pH 3.1) underground mine water is pumped to the surface to a settling pond. The settling pond discharges to the Iron River, in the City of Iron River, through a series of ditches and culverts

Sanitary sewage from the mine is disposed of through an Imhoff Tank and subsurface percolation. The need for additional control of these wastes to protect against unlawful pollution has not been established.

MICHIGAMME RIVER

MARQUETTE IRON MINING COMPANY

Republic Mine

The Republic Mine is located in Republic Township, Marquette County, Section 7, T. 46 N. R. 29 W. This mining operation consists of open-pit mining of low-grade iron ore with subsequent beneficiation by flotation processes. Waste discharges consist of finely divided solids suspended in water. The solids are finely ground rock particles which have separated from the iron ore. These wastes, which are called tailings, are discharged to a series of four ponds comprising a total area of 860 acres, which are operated in series. Effluent from the final pond is discharged to the Michigamme River in the Village of Republic.

This mine is operating its waste disposal system under terms of a Water Resources Commission Order which was issued, following submittal of a statement of new use by the company in compliance with the statute, on March 15, 1955. The Order, adopted on May 25, 1955, and supplemented by an identical Order adopted on June 27, 1962, to reflect new ownership of the mine, restricts the amount of suspended and settleable solids and chemical substances discharged to the Michigamme River. The Order also controls the discharge of sanitary sewage and pH of the waste water. The restrictions were designed to protect the waters of the State from unlawful pollution as defined by Michigan Statutes. Control of wastes is rated as adequate.

STURGEON RIVER

HANNA MINING COMPANY

Groveland Mine

The Groveland Mine is located in Felch Township, Dickinson County, Section 31, T. 42 N., R. 29 W. This mining operation consists of open-pit mining of low-grade iron ore with subsequent beneficiation by hydraulic separation and flotation. Waste discharges consist of finely divided solids suspended in water. The solids are finely ground rock particles which have been separated from the iron ore. These wastes are discharged to two settling ponds comprising a total area of 350 acres which are operated in series. Effluent from the second tailings pond is discharged to Pine Creek, a tributary of the Sturgeon River. Water discharged from this pond is clean and clear in appearance.

This mine is operating its waste disposal system under terms of a Water Resources Commission Order which was issued, following the submittal of a statement of new use by the company in compliance with the statute, on August 15, 1957. The Order, adopted on March 28, 1958, restricts the amount of suspended and settleable solids and chemical substances discharged to Pine Creek. The Order also controls the discharge of sanitary sewage and pH of the waste water. These restrictions were designed to protect the waters of the State from unlawful pollution as defined by Michigan Statutes. Control of wastes is rated as adequate.

LITTLE CEDAR RIVER

WHITE HOUSE MILK COMPANY

The White House Milk Company operates a condensery and drying plant at Stephenson. Whole milk collected in Michigan and Wisconsin is processed into butter and dried skim milk powder at this location. The manufacture of condensed milk has been discontinued, but equipment is still available if the company decides to resume this operation. All wastes, which include milk can and equipment washing, floor washings, and sanitary sewage, are treated in a high rate trickling filter plant. Waste surveys have been conducted from 1948 to the present time. Treated effluent produces no detrimental effect on the Little Cedar River. The water in the river below the treatment plant is always clean and clear and numerous minnows are observed in the area. Operation and maintenance of this plant has consistently been excellent. Waste control is considered as adequate.

FRIGO BROTHERS

Frigo Brothers operate a cheese manufacturing plant at Carney. Wastes from the manufacturing process consist of whey, floor and equipment washings, and sanitary sewage. Sanitary sewage is treated in a septic tank with underground tile field disposal of the effluent. The whey is trucked to wasteland except at times when severe winter snows make trucking impossible. Floor and equipment washings are discharged to a septic tank with the effluent discharged to a ditch along with cooling water. The ditch flows into Porterfield Creek, which is a tributary to the Little Cedar River. Although the wastes cause some odor nuisance in the ditch, staff investigations have not shown sufficient public injury, as defined by Michigan Statutes, that would warrant staff recommendations for Commission action. Because of occasional local odor nuisance conditions in the waste ditch, an adequate rating for waste control has been withheld. Control is rated "adequacy undetermined."

MENOMINEE RIVER

KINGSFORD CHEMICAL COMPANY

This company ceased its operations at Kingsford in the spring of 1962. The purpose of including this information in the report is to show the waste loading which was removed from the Menominee River by cessation of company operations as it relates to investigations of water quality in the Menominee River.

A comprehensive industrial waste survey was carried out on July 28 and 29, 1960, results of which are summarized below.

Waste Flow: 11.265 mgd

Amount of 5-day B.O.D.: 5,637 lbs.

Amount of Suspended Solids: 4,510 lbs.

Amount of Suspended Volatile Solids: 4,510 lbs.

SCOTT PAPER COMPANY

Menominee Groundwood Mill

The Scott Paper Company operates a small pulp mill in the City of Menominee. Partially processed pulp is made by grinding spruce, balsam, and poplar wood with water power. Wastes from the manufacturing operations are discharged to the Menominee River. Principal waste constituents are paper solids in suspension and oxygen-consuming substances. Waste control is accomplished by a saveall and by in-plant housekeeping methods to control losses. The need for additional control of these wastes to prevent unlawful pollution has not been fully established.

MARATHON DIVISION OF AMERICAN CAN COMPANY

Marathon, Division of American Can Company, operates a paper manufacturing plant in the City of Menominee with wastes discharging to the Menominee River. Principal waste constituents are paper fiber solids in suspension. This manufacturing plant has no pulp mill. Partially processed pulp is shipped into the plant from other company-owned Canadian mills. Control of solids losses is accomplished by a saveall and water reuse.

A baffled wax trap device is maintained to collect any wax spilled in the paper waxing process. There has never been a wax-associated waste problem created by this company's operations.

Sanitary sewage from the mill is segregated and discharged to the Menominee municipal system. Continuing surveillance has not established that the waste discharges create injury to present uses being made of the Lower Menominee River waters or adjacent waters of Lake Michigan. Control of wastes is rated as adequate.

That finishes that particular section of the report, Mr. Chairman.

MR. STEIN: Thank you.

Are there any questions or comments?

(No response.)

MR. STEIN: I think this is surprisingly close to the Health, Education, and Welfare Report on Industries.

I have one question, and this is for explanation. Generally, you talk about the point that it doesn't create unlawful pollution as defined by the Michigan statute, and when you do get to the Marathon plant, you say, "Continuing surveillance has not established that the waste discharges create injury to present uses being made of the Lower Menominee River waters or adjacent waters of Lake Michigan."

Is there any reason for the difference of characterization that you have used up to now until you got to the Marathon Company?

MR. PURDY: No, sir. This is stated with respect to present uses.

If surveillance tomorrow indicated that there was an injury to present uses, or if uses change to the extent that an injury occurred, we would expect to ask the Marathon Division of the American Can Company to upgrade their waste control.

MR. SCHNEIDER: I would like to ask a question on Page 42.

You said, "In 1962 dewatering of the old Homer-Cardiff mines," and so forth. When did the dewatering start?

MR. PURDY: I will turn back to the appendix. I believe it is a part of our report.

This was first brought to the attention of our Commission on August 30th of 1962. The staff had knowledge of the problem prior to this time.

I believe the pumping of the Homer-Cardiff shaft started in about February of 1962. The first waters pumped from this shaft were neutral, and the problem did not immediately become evident.

MR. SCHNEIDER: Thank you. I have one other question.

You mention discharges from the settling ponds. Do you have the pH for these on the effluents in the ponds in the appendix?

MR. PURDY: This is included in the appendix.

MR. SCHNEIDER: Thank you. Do you know what they are?

MR. STEIN: As far as you know, there would not be any adverse pollution?

MR. PURDY: That is correct.

MR. SCHNEIDER: All right.

MR. STEIN: Are there any further questions or comments?

(No response.)

MR. STEIN: If not, I hope you will bear with us, and we will stand recessed until nine o'clock tomorrow.

Tomorrow, I am sure, is positively the last day. We should be able to finish this in the morning.

Thank you.

(Whereupon, at 5:10 p.m., the conference was recessed until the following day, November 8, 1963, at 9:00 a.m.)

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